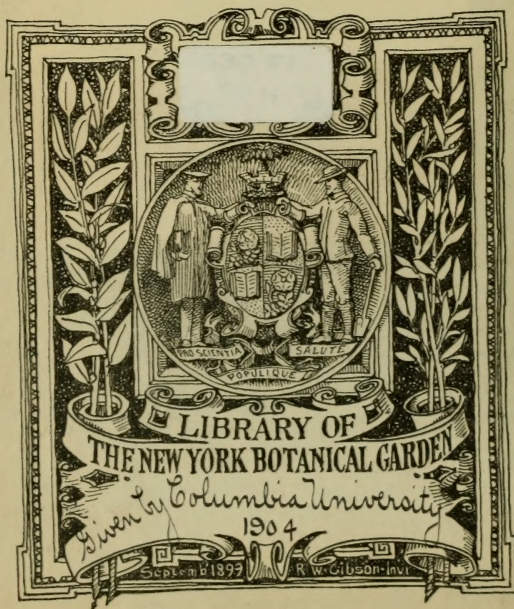
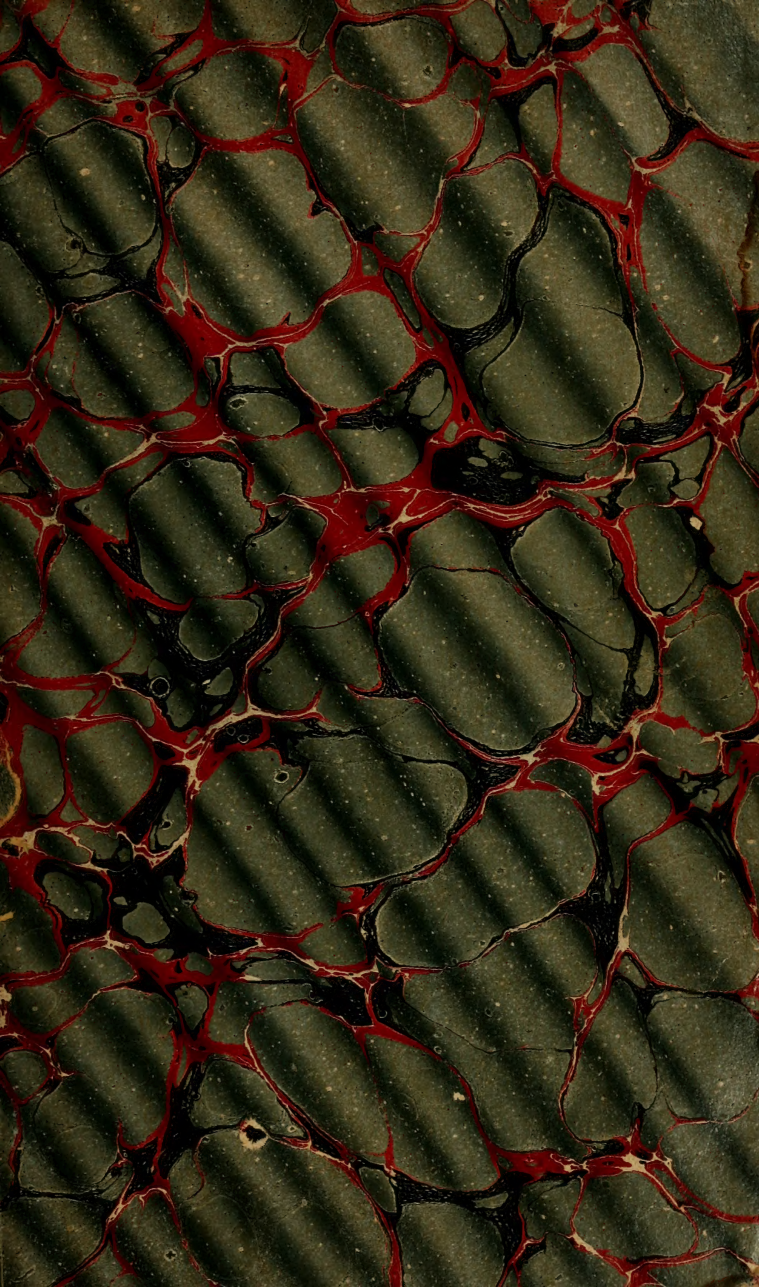


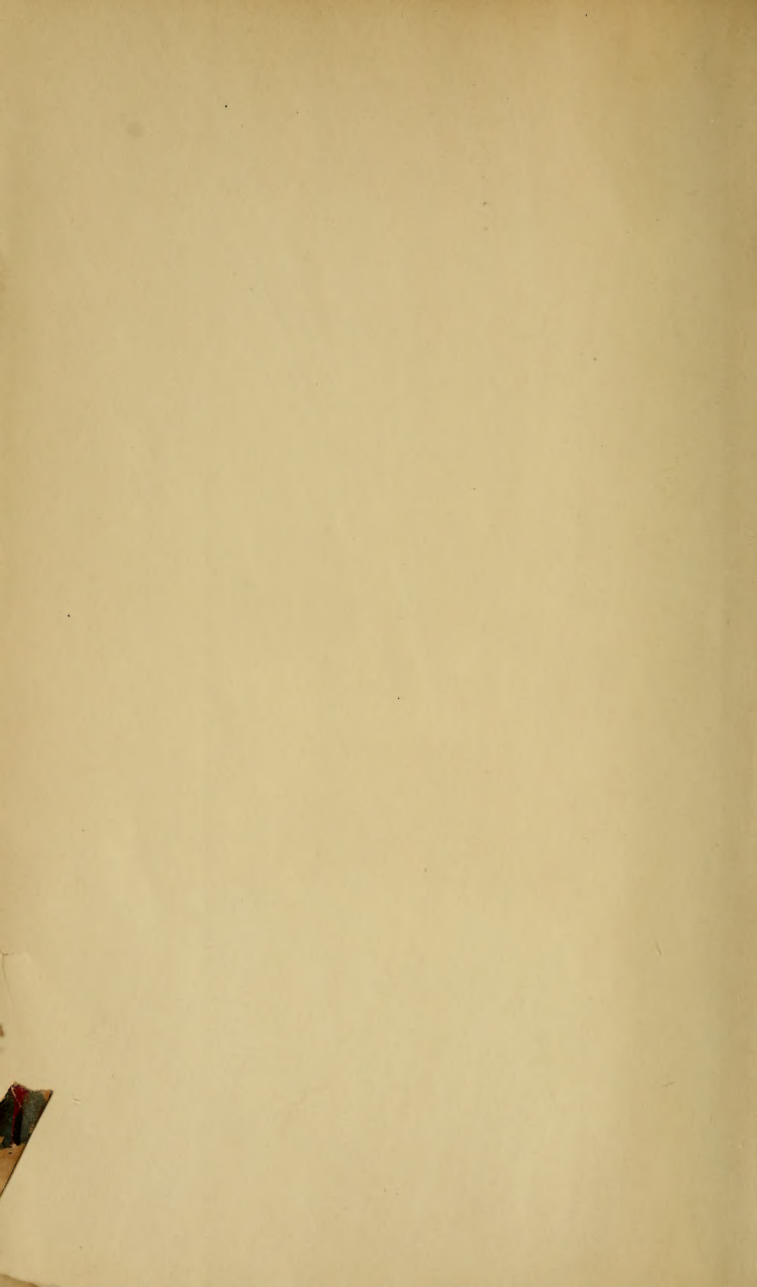
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MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE.

JANUARY AND FEBRUARY, 1876.

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MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,
Statistical Division, January 31, 1876.

SIR: I herewith submit a digest of January returns of the comparative numbers and home prices of farm-animals in the several States, with the respective rate of yield and current prices in December of the principal farm-products of last season. I include, also, material from the chemist, microscopic observations, and minor facts in statistics and agriculture.

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

DIGEST OF MONTHLY RETURNS.

The present report contains digests of the returns made in January of the present year of comparative numbers and prices of farm-animals; and also of the returns of the yield per acre and prices of farm-products. These returns, in connection with the previous returns of quantity of farm-products, form the basis, when carefully combined and analyzed, of the estimates of the year, which are published in the annual volume.

COMPARATIVE NUMBERS AND PRICES OF FARM-ANIMALS.

NUMBERS.—The numbers of farm-animals, as indicated by the estimates of correspondents, are not keeping pace with the advance of the country in population. Horses appear to have made the greatest increase, amounting to about 3 per cent.; cows are more numerous by 1 or 2 per cent., while other descriptions of cattle have not increased. Sheep are found in larger numbers only in the more western States, the aggregate being little larger than that of last year. Swine appear to have decreased about 8 per cent. This may be correct, as no stock of the farm is so subject to rapid fluctuations in numbers, very few being kept more than two years, and quite a large and increasing proportion of pigs being killed before a year old. The States showing the largest increase in cattle are Nebraska, Oregon, Minnesota, Louisiana, Iowa, no others having more than 3 per cent. advance. Minnesota, California, Oregon, and Arkansas have the largest percentages of milch-cows.

Nebraska shows the largest proportion of horses, in comparison with last year's record, followed by Oregon, Texas, Arkansas, Iowa, Kansas, West Virginia, and North Carolina. The largest increase in sheep is in Kansas, Nebraska, Florida, Texas, Minnesota, and Oregon.

PRICES.—The prices of horses of all ages appear to have retrograded very generally during the year. The only exceptions are Texas, Kansas,

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and Nebraska. In Texas there is a tendency to advance in all kinds of farm-animals, in part from relative decrease in numbers, and also because of increasing facilities for meeting the demand from other States, and from the improvement of animals by breeding and care. The decrease is only nominal in Arkansas and Tennessee. It is greatest in the Eastern States. The following figures may be deemed representative of the prices in districts indicated by the States named :

States.	1876.				1875.			
	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.
Massachusetts	\$30 00	\$48 33	\$72 66	\$108 33	\$44 17	\$66 66	\$95 00	\$135 00
Pennsylvania	34 58	54 72	80 45	108 39	37 02	63 72	92 25	123 20
North Carolina	31 31	48 16	67 92	90 00	33 73	52 54	75 96	96 74
Mississippi	27 41	42 79	62 35	89 00	25 70	45 75	65 00	94 20
Texas	13 04	19 32	28 28	45 50	13 11	19 77	28 26	44 81
Kentucky	26 25	39 60	55 30	75 00	26 55	40 46	57 19	78 00
Iowa	26 73	40 60	59 52	84 88	27 18	41 50	61 58	85 47
Oregon	19 00	27 50	39 25	60 43	19 30	28 00	39 50	60 30

The value of mules has declined very materially from New York to Florida. In Alabama the downward tendency is checked by prosperous cropping, a disposition being manifested to encourage home supplies, placing the prices for young mules higher than in 1875. There is no material falling off in Mississippi, and in Texas there is a slight advance, as in the case of horses. Prices are pretty well sustained in Arkansas, and in Tennessee. In the Western States the decline is quite sharp, as shown by the following table :

States.	1876.				1875.			
	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.
Georgia	\$31 34	\$50 69	\$79 11	\$99 00	\$40 30	\$65 00	\$96 25	\$115 50
Mississippi	32 00	50 50	74 50	102 70	31 33	50 20	76 50	102 10
Tennessee	32 80	49 02	72 50	90 00	33 53	51 58	75 00	93 30
Kentucky	29 24	46 70	68 50	88 72	30 71	47 70	70 10	91 91
Indiana	22 81	45 59	68 67	96 15	31 79	48 88	71 34	97 77
California	23 00	34 33	55 00	93 50	29 95	32 53	52 38	88 39

The rates for milch-cows are not sustained in the Eastern States, except in Connecticut and Massachusetts. The average is the same as that of last year in New York, a decline being perceptible in the remaining Middle States. There is an increasing demand in Maryland and Virginia, States well suited to dairying, and prices have advanced somewhat. In the Carolinas and Georgia the rates sympathize with the prevailing downward tendency. From Florida westward along the Gulf coast, and in Arkansas and Tennessee, prices are higher, the greatest proportionate increase being in Texas. In every State of the great interior valleys there is an increase, except in Nebraska, where prices ruled very high last year. On the Pacific coast the high California rate

of last year is not fully sustained. A comparison with last year is made in the rates of the following States:

Year.	New York.	Virginia.	Georgia.	Texas.	Ohio.	Wisconsin.	Missouri.	Oregon.
1876.....	\$37 50	\$22 77	\$17 02	\$15 72	\$32 65	\$26 75	\$20 86	\$21 75
1875.....	37 50	22 94	18 85	13 33	30 42	26 37	19 50	21 65

The class including all cattle except cows exhibits no very sweeping changes. The abundance or scarcity of supplies for winter use causes local changes. In the Eastern States, prices are firmer in Vermont and Massachusetts; in Pennsylvania, in the Middle States; in Maryland, North Carolina, Alabama, Texas, the more eastern States of the Ohio Valley, with a positive rise in the district west of the Mississippi. There is little decline in New York, Delaware, Virginia, South Carolina, Mississippi, Wisconsin, and Minnesota. There is some decrease in several of the New England States, in New Jersey, Georgia, and little in Indiana and Illinois, except that in the latter prices of matured stock are well sustained. The following comparison is made:

States.	1876.				1875.			
	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.	Under one year old.	Between one and two years old.	Between two and three years old.	Over three years old.
Maine.....	\$10 89	\$20 43	\$33 19	\$58 22	\$11 56	\$21 12	\$34 09	\$63 00
New York.....	10 31	19 40	32 08	51 96	10 45	19 50	32 64	52 08
North Carolina.....	3 55	6 33	10 21	15 35	3 35	6 00	9 40	14 70
Georgia.....	3 97	5 97	9 29	13 47	4 10	7 00	10 75	15 00
Texas.....	3 54	5 87	9 13	14 18	3 18	5 22	8 16	11 82
Kentucky.....	8 22	14 72	24 32	36 05	8 22	14 25	22 12	34 53
Illinois.....	7 50	14 00	24 24	35 74	9 00	15 48	25 60	34 69
Missouri.....	6 41	11 56	18 59	28 81	5 58	10 00	16 42	24 25

The rates for sheep are not materially changed in the Atlantic States north of Virginia, or in the Gulf States. In the Southern Atlantic States and in the Ohio Valley there is a slight tendency to high rates, and in the Missouri Valley prices are still more advanced. The numbers of sheep on the Pacific coast are so increased that in dry seasons some districts are over-stocked, tending to decrease in prices, which is indicated to some extent in the present returns from California. The prices of full-grown sheep are thus reported in the following States:

Year.	Vermont.	Pennsylvania.	Virginia.	Georgia.	Texas.	Tennessee.	Ohio.	Illinois.	Nebraska.
1876.....	\$3 97	\$3 95	\$3 15	\$1 94	\$2 29	\$2 40	\$3 09	\$2 75	\$3 00
1875.....	4 22	3 90	3 17	1 76	2 16	2 20	3 00	2 54	2 74

A slight increase in the prices of hogs is observed in New England, especially in those of more than one year old. There is an advance in the Middle States, in Virginia and North Carolina, but in South Carolina and Georgia prices are not fully maintained. In Arkansas and Tennessee, where supplies were scarce and high last year, with low prices for all kinds of stock, there has been a manifest advance the

present season. The Western States all return higher prices than last year. The following figures for old hogs will represent the general tendency of prices in the several sections, and for further comparison reference is made to the table:

Year.	New Hampshire.	New Jersey.	Maryland.	Alabama.	Arkansas.	Kentucky.	Indiana.	Iowa.	Kansas.
1876	\$27 25	\$20 50	\$10 27	\$6 07	\$6 10	\$10 19	\$13 33	\$13 75	\$14 92
1875	24 00	18 75	9 73	5 81	4 46	8 67	9 30	12 13	6 67

A few extracts from remarks of correspondents are appended:

MAINE.—*Cumberland*: Milch-cows have increased in numbers on account of increased interest in dairying. *Piscataquis*: Great scarcity of money has made a complete stagnation in sales of stock of all kinds.

CONNECTICUT.—*New London*: The number of cattle is less than a year ago, as the farmers are working all they can into beef, to save hay.

NEW YORK.—*Erie*: The number of hogs has not varied much more for two or three years, but within that time their average weight has increased at least 30 per cent.; mostly by the introduction of Chester Whites. Western hogs are so liable to sicken and die, that they are growing into disfavor. *Delaware*: The short hay-crop caused the sale of nearly all the calves, and all animals fit for beef are slaughtered. *Sullivan*: The percentage of cattle reduced by scarcity of hay.

PENNSYLVANIA.—*Beaver*: The decrease in milch-cows is owing to the fact that farmers are quitting the shipping of milk to the cities. *Chester*: There is an increase in the number of horses and cows, the latter being usually bought from other sections; but fewer cattle are raised and there is a marked decrease in the number of oxen and other cattle. *Washington*: Few colts raised the last three or four years, and fewer this year than ever. Hogs are scarce and high. *Bedford*: Mules are being brought from Kentucky to take the place of horses on farms and manufactories. Many of our feeding-cattle are brought from the western markets, and 60 per cent. of the calves dropped go to the market before they are one month old. *Butler*: A plenty of good horses for all purposes for sale at low prices. As the country is becoming more settled, and the farms becoming better, sheep-raising does not pay so well, and consequently is decreasing. Hogs were never so scarce. *Elk*: Prices for stock are nominal, except for beef and hogs, which are in good demand. *Tioga*: Mules for the coal-mines are nearly all brought from New York State. *Erie*: Milch-cows have increased. Cheese-factories have sprang up in almost every town.

MARYLAND.—*Montgomery*: Hogs are scarce. Thrifty pigs, four weeks old, readily bring \$2. *Prince George's*: We are raising more sheep than formerly, and there is an increase of interest in raising hogs. *Frederick*: Sheep-husbandry not increasing in respect to numbers rapidly, but improving in stock, principally long wool. Hogs rather scarce; no surplus. *Baltimore*: First-class horses in demand. Milch-cows in good demand and selling briskly.

VIRGINIA.—*Prince George*: The absence of fences prevents the increase of stock. The number on each farm is very limited. *Dinwiddie*: Raising more colts than usual; also raising more hogs for pork. The dairy business is growing in favor, and sheep-raising is on the increase. *Fauquier*: No calves raised except occasionally one for a breeder; all dropped being sent to market as veals. We buy sheep brought from the West, in the fall, winter and shear them; then sell both the old stock and the lambs and buy again. *Halifax*: The stock of hogs is smaller than for years; many have died of cholera, and some of measles and quinsy. *Cumberland*: The increase in the number of oxen is owing to the fact that the colored people, having with their labor purchased small tracts of land, are raising them for work. *Powhatan*: Farm-stock has been gradually increasing for several years. More attention is given to the raising of mules and horses than in any year since 1860. Many farmers have come to the wise conclusion that it is better to raise their stock of mules and horses than to trust to the machinations of horse-traders. Nearly every farmer of any note has also raised bacon enough for next year's consumption. *Sussex*: The fences were all destroyed during the war, and the utter impossibility of yet replacing them is the principal cause of the falling off in milch-cows. *Chesterfield*: The number of horses is kept up by new settlers from the North and West. Mules are chiefly used by the old residents, being considered more durable and valuable. Milch-cows are increasing in numbers and importance, as we improve our lands and increase the growth of grass and clover. There is a decided disposition to improve the quality of sheep. Two of my neighbors, northern settlers, have recently purchased one hundred and fifty and placed them on poor

fields, as an experiment. A decrease in the number of hogs, owing to the killing of many stock-hogs for pork, the price being \$9 per hundred-weight. *Henrico*: A disposition to increase the number of stock-hogs, owing to the low price of corn. *Pittsylvania*: The hogs are of the inferior stock called "Virginia pine-rooters." *Orange*: The last five or six years, so fatal to young grass, have checked the increase of stock, and caused the sale of young cattle at almost any price.

NORTH CAROLINA.—*Chowan*: Cattle and hogs have decreased. Farmers will have to plant less cotton and raise more stock and grain, or they will soon play out. *Brunswick*: The marked decrease in milch-cows is owing to severe weather last winter; feed gave out, and they had to be turned out into the swamps. *Nash*: More inclination to raise cattle and sheep than for some years. *Hertford*: Stock of every kind are steadily increasing, save sheep, and they would do well but for the multitude of dogs.

SOUTH CAROLINA.—*Chester*: The freedmen are accumulating more stock, and take better care of it than formerly.

GEORGIA.—*Laurens*: Work-oxen are \$30 to \$60 per pair; beef-steers, at maturity, \$20 to \$30 each. *Montgomery*: Most of the horses and mules are brought here from Tennessee, Kentucky, and Indiana. *Gwinnett*: Horses, mules, and other stock are 20 per cent. lower in price than a year ago, owing to the low price of cotton and money-pressure. *Cherokee*: For the last few years we have been using commercial fertilizers to raise cotton, and neglecting out-stock. The consequence is that a large number of people have no meat-supply and no money to buy with. *Covington*: The hard winter of last year and the hog-cholera have reduced the number of our stock. *DeKalb*: Though sheep have suffered from dogs, more attention than formerly is being paid to sheep husbandry. The flocks are more closely watched and cared for. *Perry*: There is a decided disposition to raise more horses, cattle, and hogs.

MISSISSIPPI.—*Lauderdale*: Cattle and sheep have been diminished, owing to the high price of meat. The increase in provision-crops has caused an increased effort to raise hogs, and but for the persistent stealing of hogs by the negroes, the farmers of the county would raise their own pork. As it is, more will be raised here in 1876 than since the rebellion. *Noxubee*: Stock-hogs increased in number, and healthy. If the thieves will suspend, we will soon be self-sustaining. *Wilkinson*: More attention to the raising of hogs than for some years. Full-blooded Berkshires most in demand. Pigs six to eight weeks old sell for \$20 per pair; young sows with pigs, at \$20 or more each. Inferior hogs cheap. *Coahoma*: The raising of hogs has almost ceased in consequence of depredations by the freedmen. This evil seems to have no remedy. *DeSoto*: More meat killed than for years, and we are becoming independent in the way of "hog and hominy." *Lee*: Stock-raising is losing ground. Hogs over one year old are now scarce, from the fact that mast and corn were plenty, and meat is scarce and high. *Jefferson*: More attention is being paid to the raising of horses, cattle, sheep, and hogs than ever before.

ALABAMA.—*Anite*: There has been an average decrease of about 10 per cent. in the value of all stock except sheep. They now sell for as much per head as last January, and I think there is an advance in the price.

LOUISIANA.—*Jackson*: Average value of horses and mules, \$40 per head; oxen and other cattle, \$5; milch-cows, \$10; sheep, \$1; hogs, \$1.

TEXAS.—*Smith*: Hogs are seldom slaughtered under eighteen months old, and usually at two years old and upward. Hog-stealing is now a penitentiary offense, and more attention is paid to raising hogs and improvement of breeds. *Burnet*: Hogs over one year old very scarce. *Goliad*: The greatest change in stock-raising results from the increasing disposition of the farmer to combine with that branch other agricultural industries. *Titus*: Mule-raising is on the increase, and they will soon take the place of horses on the farm. Beef-cattle killed up very close, owing to a great scarcity of bacon, caused by cholera among hogs. Hogs healthy now, and a good increase the past fall; nearly a supply for the county. Pork 10 cents per pound. *Williamson*: By a late law hogs are not allowed to run at large; consequently the number is less. *Bell*: Neat-cattle have been driven to western and California markets until the number is getting down below home necessities. The county is gradually introducing short-horned cattle and Berkshire hogs. *Bastrop*: Most of the beef-cattle and oxen have been driven from the county to the northwestern States. While the percentage of hogs has fallen off better hogs are being grown—Poland, China, Berkshire, and Essex. *Lampasas*: The number of horses has increased in consequence of increased immigration into the county in 1875. *Lamar*: The increase in horses and mules is owing more to immigration than any other cause. *Grayson*: We maintain our percentage in horses and mules more by immigration than by raising them. *Collin*: The decrease in cattle is due to the fact that some large cattle-raisers have moved their herds farther west for better range. *Dallas*: What stock is kept on the farms is of better quality than that formerly raised, and there seems to be a general disposition among the farmers to improve their stock. *Cooke*: Reference to the tax-rolls shows the number of horses to be 8,406; average price, \$35. Cattle, including milch-cows, 41,175; average price, \$7. Sheep, 2,353; average price, \$1.50. The estimated number of hogs 3,300, and the value \$3 per head. *Hunt*: The native stock of horses is decreasing, and better breeds are

taking the place. The same is true of mules, stock-hogs, milch-cows, and other cattle. *Austin*: Sheep-raising is spreading again where the range is still sufficient. *Upshur*: Owing to the driving of cattle west from this portion of the State, they are getting scarce. *Wood*: Hogs are on the decrease, owing to the short corn-crop for the last two years and no mast. *Fort Bend*: Milch-cows receive but little attention. A citizen may own 5,000 and not milk one during the year. *Nueces*: Horses are increasing very rapidly. Cattle are daily decreasing in numbers; they are being driven off to Mexico by armed bands, who live by plundering. Sheep are increasing rapidly, and are paying from 30 to 50 per cent. on the investment.

ARKANSAS.—*Dallas*: The horses raised are very inferior. About as many horses and mules are bought from drovers as are raised. *Isard*: The great scarcity of fattening-hogs has caused many to be killed which were too young, and otherwise would have gone over to the next season. *Crawford*: There are in the county at this time 5,384 sheep; some 2,000 have lately been driven to Kansas for better pasturage and protection. *Independence*: Farmers who keep brood-mares find it more profitable to raise mules than horses. *Fulton*: Some are awaking to the importance of better stock than our long-continued "scrub," and are procuring improved stock of cattle, hogs, and sheep. *Howard*: A new impetus has been given to hog-raising in this and the adjoining counties. A fair crop of mast has caused the country to abound in pigs. I think 200 is not an over-statement of the percentage. *Prairie*: Sheep-raising is rapidly increasing.

TENNESSEE.—*Smith*: Sheep are higher than last year, because the quality is greatly improved. No hogs a year old, except breeding-sows: all others have been slaughtered. Nearly all on hand are sucking-pigs and many are depending on pigs yet to come for next season. *Grainger*: Our market for horses and mules is in the cotton States, where they have ruled very low. Cattle and sheep have sold better than last year, and consequently fewer are on hand. Hogs have sold at \$6 to \$6.50 gross. *Bedford*: Hogs were better fattened than usual, and consequently stock for another year is very scarce. *Coffee*: Hogs have been disposed of at 6½ cents gross, at the railroad station. *Rutherford*: Owing to the failure in the cotton-crop, farmers are disposing of all their surplus stock. During the last six weeks an average of three car-loads of mules per week has been shipped from this point, and droves are still shipped. *Lincoln*: The very short corn-crop in 1874 lessened the number of hogs; efforts now to increase them. Prices of horses and mules lower than for years. Imported breeds of cattle much higher than the figures given for the average. *Loudon*: Except sows, all the hogs here over one year old have been put into market. Average price, 6½ cents per pound, live weight, and average weight 200 pounds. *Monroe*: Fine stock is being introduced into the county very fast, such as short-horn and Jersey cattle, Cotswold and Southdown sheep, Berkshire and Essex hogs, and trotting horses. *Davidson*: The crop failures of 1874 caused unusual waste of cattle by the butchering, starvation, and sales at serious loss. Hog-cholera, added to the above cause, brought hogs down in number at least 50 per cent., and perhaps more. Sheep have increased under an excellent dog-law, and will continue to advance in character and number if that law remains in force. *Gibson*: Hogs reduced, last winter, by starvation and disease, were in almost universal demand the present season: a sow and pigs commanded almost fabulous prices. The Berkshire are preferred to any other stock.

WEST VIRGINIA.—*Jefferson*: Sheep are increasing very rapidly.

KENTUCKY.—*Madison*: A decrease in the mules raised, owing to a heavy decline in the price for the two previous years. The raising of horses has been stimulated and increased by the opposite reason. *Fleming*: The decrease of hogs is caused by the loss of pigs by disease, known as cholera, and by the high price, forcing into the market all large enough to kill.

OHIO.—*Clark*: Raising more fine horses than formerly: some worth \$500 to \$1,000: cattle dull; hogs high: 7½ cents per pound gross. *Coshocton*: But few horses have been sold for the eastern market, owing to the low price; fully 5 per cent. of the matured horses are now for sale. Hogs of the same age and breed average fully 10 per cent. less in weight than last year. *Lucas*: Some good blooded horses were brought into the county within two or three years, increasing the raising of colts of a higher grade. *Monroe*: Fat hogs selling at 5½ to 6 cents live weight. *Licking*: Hogs very high. Stock-hogs, that is, under one year old, sell as high as 8 cents. *Washington*: Cows are from \$30 to \$50. *Tuscarawas*: All kinds of stock have fallen off in numbers for several years, owing to short hay-crops and long feeding-winters for the last three years, and to increasing shipping facilities which induce stock-men to cull out more closely. *Williams*: The price of horses is lower than for sixteen or twenty years: so low that farmers do not think it pays to raise colts. Hogs are scarce, owing to the fact that money is scarce, and they bring a pretty good price. Moreover, farmers are now beginning to see that it does not pay to keep a hog over winter, so that few are now kept, except for breeding purposes. *Proble*: Horses are 40 per cent. lower than they were eight months ago. A great many cattle were sold off after harvest for fear they could not be wintered. This has caused a deficiency. *Perry*: The reduction of cattle is owing to the fact that the scarcity of feed last winter caused every one to dispose of all he could. *Adrian*: Very

few hogs remain over: some for breeding purposes. The breed has been greatly improved. No difficulty in making spring-pigs weigh 200 to 300 pounds by November, and those weights bring the best prices. *Delaware*: The large number of hogs coming on will make cheap pork within the next twelve months.

MICHIGAN.—*Hillsdale*: The price of fat cattle in the market is \$3 to \$4 per hundred; fat hogs, on foot, \$6; dressed, \$7.50. *Cathoun*: Sheep have been sold less than usual; many of our farmers finding them indispensable and profitable for their farms. *Mecosta*: As the county develops, all kinds of farm-animals are increasing.

INDIANA.—*Clay*: Sheep-husbandry declines, owing to destruction by dogs; mule-raising declines for want of a certain and remunerative market. *Wabash*: The high price for hogs has used up the stock very clean, except a few for breeders. *Stark*: Oxen and other cattle have not been sold out so close for ten years. *Warren*: Hogs have brought \$6 to \$8 per hundred. *Ohio*: As corn is cheap and pork high, everything that will make pork is being fattened. *Hamilton*: Hogs very scarce owing to deaths by cholera. *Washington*: About all the hogs over six months old have been fattened and sold at \$6 to \$7.15 per hundred gross.

ILLINOIS.—*Winnebago*: A large proportion of the calves sold to butchers. *Mercer*: The decrease in mules is owing to the fact that the epizooty took most of the jacks out of the county. *Piatt*: Not many cattle over three years old in the county, except milch-cows. *Iroquois*: The number of hogs fattened will fall short of an average 30 per cent., but the quality will raise the quantity. *De Kalb*: A falling off in the price of cows, owing to a decline in dairy products, especially cheese. *Ford*: The increase in the number of horses is owing to immigration. *Carroll*: All kinds of stock are declining in numbers, except horses and milch-cows. The number of horses is kept up because there has been no demand from abroad, and of cows, because the farmers are turning attention to the manufacture of cheese on the co-operative plan. *White*: The decrease in farm-stock is owing to scarcity of feed. Hogs have been shipped to the greatest extent. *Boone*: Scarcely any hogs over one year old, and very few cattle over two and a half or three years.

WISCONSIN.—*Clark*: The increase in stock of all kinds is owing to the fact that the county is new and rapidly developing. *Crawford*: Hogs and sheep are the only kinds of stock which have paid expenses, sheep paying best; dressed hogs \$7.50. *Green Lake*: The quality of all kinds of farm-stock is gradually improving. Sheep are the favorite stock, and the finer grades are most numerous, being kept mostly for wool. *Columbia*: Great numbers of young hogs shipped, owing to the short corn-crop. *Green*: Nearly all the hogs not sent to market are under one year old, and some of them will be marketed between this and spring. There is a steady increase in the number of cows, the dairy business growing constantly.

MINNESOTA.—*Waseca*: We are beginning to raise cattle and hogs, instead of so much grain. Cheese-factories are springing up; hence the increase in cows. *Faribault*: Farmers have learned by sad experience that persistent efforts to make a living by wheat-culture alone only renders them poorer and poorer every year, and, therefore, are paying more attention to the raising of stock and hogs than ever before.

IOWA.—*Sioux*: The prices of horses, mules, cattle, and hogs are much higher in our newly-settled county than in the regular market. *Polk*: While fewer mules have been raised, a larger proportion has been shipped South and to Colorado. Both fat and stock-hogs sell readily at 6 to 6½ cents per pound. *Howard*: Hogs bring a good price and are selling off rapidly; lowering the percentage of stock hogs, and raising the price of young pigs. *Scott*: Most of the fat hogs sold are from fifteen to twenty-two months old. *Linn*: The hog crop is 10 per cent. short. *Cherokee*: The price of pork has created quite a demand for stock-hogs.

MISSOURI.—*Jasper*: Native breeds of cattle are being greatly improved by the introduction of full-bloods. *Howard*: Almost impossible to purchase hogs of any age. Never knew the difference to be so great between the prices of corn and of hogs; corn 20 cents per bushel, and stock-hogs 5 to 6 cents per pound. The hogs fattened next year will be spring pigs. *Jefferson*: Milch-cows scarce; average price, with calf, \$30. Mules are superseding horses here. *Marion*: Stock-hogs rate at about 5 cents, fat hogs at 6. *Carroll*: The increase in the total number, and the large percentage of oxen and other cattle, is owing to the great number brought into the county to feed. *Reynolds*: Cattle, young horses, sheep, and hogs are reduced very much, owing to scarcity of feed and severe weather last winter. *Polk*: Hogs sell at 6½ cents, live weight. *Platte*: Hogs selling at 9½ cents, gross. Pork-packing in the county not yet over; 1,500 to 2,000 fat hogs still on hand. *Perry*: The reduction in cattle and hogs is owing to the scarcity of feed last winter. *Dent*: A great many cattle have been shipped out of the county. *Dallas*: Large hogs were thinned out last winter by cold and starvation, and the number is not yet made up. The increase in milch-cows results from more and better feed than last year. *Caldwell*: Fat hogs and breeding sows are much higher in price than usual. Many cattle are being fattened. *Barton*: Last year we sold all our hogs off, owing to a failure in the corn-crop; now we have to pay \$10 per head for pigs. *Holt*: About 3 per cent. of the hogs have died from disease. Every case is

called cholera, but this is doubtful, as some cough, then fail in appetite, and die in a few days.

KANSAS.—*Dickinson*: A marked increase of horses, and especially of mules, within the last three months. *Wabaunsee*: The percentage of pigs and the price of hogs are very high, owing to the fact that at the 1st of January, 1875, most of the hogs had been disposed of on account of the grasshopper-famine. *Nemaha*: The percentage of oxen and other cattle is large, on account of many fattening cattle this winter against very few last. *Mitchell*: Sheep are in great demand. *Franklin*: The low percentage of hogs is owing to the destruction of the corn-crop in 1874. Those that could not be sold were given away to any one who could keep a pig. There is a growing disposition to keep sheep; the chief difficulty in the way is the distance to travel in order to buy, as they cannot be purchased near at hand. *Leavenworth*: Hogs one year ago were nearly all sold to Iowa and Illinois; so we have only what we have raised since. *Montgomery*: The large percentage of calves is owing to the fact that heretofore little attention has been paid to stock for feeding. *Osage*: At least 50 per cent. of the cows had no calves the past season. The county is almost without any hogs; they sell readily at 10 cents per pound, gross. *Lyon*: Owing to previous failures in the corn-crop, hogs had been nearly all sold out of the county; owing to the abundance of the last crop, many have been shipped in. *Butler*: Having but little corn last year, we wintered but few hogs, but a great many pigs were raised last summer. *Anderson*: Stock is improving in quality; thorough-bred and grades are taking the place of Indian or Texas stock. Our stock of hogs is of fine quality, mostly pigs. With our last good corn-crop we will increase the number of our hogs very rapidly.

NEBRASKA.—*Seward*: Sheep in good demand, but none to sell. Profits on investment 75 per cent. *Webster*: Last year, owing to scarcity of feed, the greater part of the hogs and great number of cattle were killed, but the crop prospects having brightened this year the farmers greatly increased their stock of farm animals. This accounts for the high percentage. *Wayne*: Cattle and horses are increasing, and the attention of farmers seems to be turning to these branches of agriculture. The falling off in the number of hogs is owing to grasshopper depredations. *Thayer*: Hogs are very scarce and high, owing to the failure of last year's corn-crop. *Knox*: Some blooded cattle and hogs were brought into the county last month. *Antelope*: Hogs, killed off very close last year, are now accumulating very fast. Horses, mules, cattle, and sheep are on the increase. Investment in farm-stock is coming to be considered much better than in grain-raising. *York*: We have not entirely recovered from the reduction of our hog crop by the grasshopper scourge of 1874. The county is well adapted to sheep, but they are not here. *Saunders*: The failure of the corn-crop in 1874 accounts for the decrease in cattle and hogs. The decrease in sheep is due to the dogs and butchers.

CALIFORNIA.—*Sonoma*: The increase in the numbers of cows and hogs is owing to the fact that farmers are turning their attention to the dairy business. *Lake*: Hogs over one year old mostly sold off. *Placer*: Sheep-raising is becoming one of our leading industries. *Del Norte*: Large working-oxen are only used in logging, and are worth \$150 per yoke at the camps. *Plumas*: A continual increase in dairy farming for the last three years. *Mendocino*: This country, for several years, has been inclining toward sheep husbandry, and other stock has been gradually giving way. There is a gradual introduction of a better stock of horses; but few of the full-blooded Spanish mustangs are now left. *San Bernardino*: A great many sheep have gone from the county to Arizona, and 20 per cent. have died of starvation. The decrease in other stock is owing to the "no fence law."

YIELD OF FARM-CROPS IN 1875.

CORN.—The increase in quantity of corn reported in November is corroborated by the reports of yield per acre. The following table shows the comparative yield per acre of the largest corn-producing States for the past four years:

States.	1872.	1873.	1874.	1875.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Tennessee	23.5	22.5	16.8	30.5
Kentucky	31.2	29.5	25	33.3
Ohio	39.5	35	36	33.2
Indiana	38.7	25.6	27	34.5
Illinois	39.8	21	18	34.5
Iowa	39.8	29	29.2	35
Missouri	37	23.5	16	36.6
Kansas	38.5	39.1	10.5	38.4

All of the New England and Middle States report increased yields, except Connecticut; New Jersey, and Pennsylvania, report a very marked increase. All the Atlantic coast States south of Virginia, including Florida, show a decreased average, as also do Ohio, Wisconsin, Minnesota, and Oregon; all other States increase their yields. Complaints of soft corn are of wide currency in the Northern States, while injuries to farm-animals are noted at several points in the South from eating musty corn.

WHEAT.—The wheat-crop of 1875 was considerably below its predecessor, notwithstanding its increase in acreage. The estimated yields per acre of the leading wheat-producing States, given below, will indicate the comparative range of this crop in the past four years:

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
New York	12.5	13.5	15.6	8	Wisconsin	14.3	16.5	11.5	14
Pennsylvania	10.8	14.2	14.8	12.8	Minnesota	16.5	18.3	13.4	17
Ohio	11.7	12	15	9.5	Iowa	12.6	13	11.6	9.7
Michigan	12	12.2	14.2	13.5	Missouri	8.8	12.8	13.5	9
Indiana	12.4	11.2	12.2	9	Kansas	11.6	14	13.7	12.5
Illinois	12.1	13.5	11.5	10.5	California	12.2	13.5	13.2	11

Of these States only Wisconsin and Minnesota report an excess over 1874, which will be more than counterbalanced by the reduction in the other States. The crop shows a depreciation in quality as well as a decrease in quantity, and this depreciation is most serious in the great wheat-growing regions.

OTHER GRAINS.—Rye will present an increased general yield, as the average yields have been increased in most of the large rye-producing States. The oats-crop has increased its yield per acre in all the States except Maine, New Hampshire, Massachusetts, Rhode Island, California, and Oregon. The following figures illustrate the comparative yields in the leading oats-producing States for four years:

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
New York	35	31	32.8	34	Indiana	30.5	20	19	29
Pennsylvania	31.2	30.2	24.6	30	Illinois	36.6	30	17.5	33.3
Virginia	13	16.3	11.5	15	Wisconsin	35.5	35	26.2	38.5
Kentucky	24.6	24	14.4	21	Minnesota	36.5	36.1	30	36.5
Ohio	30	27	20.5	27.2	Iowa	36.7	33	30	37.7
Michigan	30	30.2	27	35	Missouri	32.7	28	22	31.6

As these States represent about six-sevenths of the oats product of the Union, their uniform and, in some cases, very large increase of yield per acre point to an immense product in 1875. Illinois, which produced one-seventh of the crop reported in the last census, shows the largest increase of yield—15.8 bushels per acre. Barley shows a general increase of yield in the Northwestern States, but a decline in the Middle and Southern States. Buckwheat shows an increased yield in most of the States.

POTATOES.—The New England States, New York, and New Jersey report yields exceeding 100 bushels per acre, Massachusetts reaching 160. Of the other Middle States, the South Atlantic and Gulf States all are below 100 bushels per acre, except Florida, 110, and Texas, 100.

All the other States report yields above that figure, except Arkansas, 70, and Kentucky, 98. Nebraska presents the maximum average—175. The comparative yields of the leading potato-producing States for four years were estimated as follows :

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Maine	75	117	123	107	Michigan	66	75	87	125
New Hampshire ..	94	150	120	133	Indiana	70	56	60	114
Vermont	107	140	145	155	Illinois	75	40	55	130
New York	88	103	105	128	Wisconsin	97	71	87	105
New Jersey	75	90	70	105	Iowa	120	44	63	121
Pennsylvania	99	96	84	96	Missouri	80	38	40	110
Ohio	80	85	71	103					

The increased averages are due to better conditions of growth and to the gradual disappearance of the Colorado beetle. The above States grow about six-sevenths of the potatoes of the country.

A special report will hereafter present the tobacco-crop.

The hay-crop shows a general decline in the New England and Middle States, with an equally general increase in the Southern and Western States. The comparative product of the last four years may be gathered from the following figures :

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
Maine	.92	.93	.88	.95	Michigan	1.25	1.15	1.00	1.20
Vermont	1.16	1.10	1.14	1.13	Indiana	1.24	1.25	1.13	1.30
New York	1.25	1.02	1.30	1.17	Illinois	1.45	1.25	1.20	1.40
Pennsylvania	1.12	1.15	1.16	1.10	Wisconsin	1.26	1.30	1.10	1.35
Ohio	1.07	1.05	.90	1.10	Iowa	1.35	1.25	1.22	1.35

The States in the above table produced about two-thirds of the crop reported in the last census-tables.

SORGHUM.—This crop, cultivated almost entirely for the manufacture of molasses, shows an increasing product in several of the States cultivating it.

The average yields of the crops will be found detailed in the general tables of this report.

PRICES OF FARM-CROPS.

CORN.—Our December returns present a fresh illustration of the dependence of the price of corn upon the home demand. At no time within the last twelve years has our foreign export equaled 4 per cent. of the crop, while it has ranged below 1 per cent. It will not bear transportation abroad to an extent sufficient to affect our home markets. The increased yield of 1875 has had its natural effect in depressing prices, both on the farm and in the market. A decline is noted in all the States except South Carolina, where it averages the same as last year, and Florida, Texas, and California, in which the price has increased. In Texas, though there has been an increase in yield, the influx of immigration has created a temporary home market for the surplus. In the other three States the yield has declined, and has in consequence enhanced the local demand. In all the other States the farmer gets less for his product, partly on account of the abundant yield and

partly on account of the continued stringency in the money market. The greatest decline is found in the trans-Mississippi regions. Iowa falls from 43 cents per bushel to 27; Missouri from 74 to 28; Kansas from 91 to 23; Nebraska from 73 to 20. This is easily explained by the destruction of the crop of 1874 by grasshoppers in this region and by the abundant crops of 1875. In New England it is noticeable that the decline is least near the commercial centers and greatest in the agricultural districts. Rhode Island, almost overshadowed by its industrial metropolis, Providence, falls off but 8 cents per bushel from last year; Massachusetts, with a greater proportion of farming-land, declines 15 cents; while in Maine, more exclusively agricultural, the fall amounts to 27 cents. This is observable to a small extent in the Middle States, but in the South Atlantic States the case is reversed. Maryland, with its small area around Baltimore, falls off 18 cents, while Georgia declines but 6 cents, and South Carolina holds her own. In the Gulf States, Mississippi, which has made the greatest increase of yield, exhibits the greatest decline, 18 cents. In Arkansas there is a great decline, 45 cents, as also in Tennessee, 27 cents. Kentucky falls off 14 cents, while West Virginia loses only 5. North of the Ohio River the fall is greatest in the southern sections, the average decline in Michigan being but 4 cents, while in Illinois it was 22 cents. On the Pacific coast, Oregon has fallen off 3 cents, while California has gained 9 cents.

The comparative prices of corn on the farm, on the 1st of December, for the last four years, in the leading corn States were as follows :

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
Pennsylvania	\$0 60	\$0 60	\$0 76	\$0 58	Ohio	\$0 34	\$0 42	\$0 58	\$0 44
North Carolina	62	64	72	60	Indiana	29	40	51	39
Texas	43	80	75	83	Illinois	24	32	56	34
Tennessee	48	58	68	41	Iowa	16	31	43	27
Kentucky	37	44	55	41	Missouri	32	38	74	28

WHEAT.—The South Atlantic and Gulf States, from North Carolina to Texas, with Arkansas and Tennessee, report lower prices for wheat on the farm, while all the other States indicate an increase. In the South this crop is grown only for home consumption, and during the past few years its acreage has considerably increased, and its product bears a larger proportion to local demand. In other parts of the country, where this crop is raised for general market, the problem of prices has been affected by influences of broader scope. The prices of 1874 were greatly reduced from the preceding year by the large crops of Europe, which limited the demand for American wheat; but the yields in Europe during 1875 were not so great, and our own crop was shortened by various disasters in different parts of the country. The result of these varied influences has been a general increase of price for wheat on the farm. In New England the increase ranged from 8 cents per bushel in Massachusetts to 12 in Vermont and Connecticut; in the Middle States, from 5 cents in New York to 9 cents in Delaware; Maryland increased 5 cents, and Virginia 4. West of the Alleghanies, West Virginia shows the greatest increase of all the States—38 cents. Kentucky and the States north of the Ohio River range from 3 cents in Indiana to 8 cents in Wisconsin; west of the Mississippi the increase varies from 3 cents in Kansas to 16 cents in Minnesota; on the Pacific coast the average price has advanced 19 cents in California and Oregon.

The variations of the last few years may be seen from the following

figures showing the prices of wheat in the leading wheat-producing States on the 1st of December:

States.	1872.	1873.	1874.	1875.	States.	1872.	1873.	1874.	1875.
New York.....	\$1 65	\$1 60	\$1 26	\$1 31	Wisconsin.....	\$1 03	\$0 97	\$0 83	\$0 91
Pennsylvania.....	1 67	1 50	1 21	1 29	Minnesota.....	83	80	70	86
Ohio.....	1 42	1 31	1 04	1 09	Iowa.....	85	79	65	71
Michigan.....	1 46	1 35	1 08	1 15	Missouri.....	1 41	1 13	83	95
Indiana.....	1 32	1 22	94	97	California.....	1 11	1 32	99	1 18
Illinois.....	1 23	1 10	86	91					

COTTON REPORT FOR DECEMBER.

The returns of the growing season, from June to October, or from the time when the stand is well established to the close of the first picking, comprise all the systematic reports of condition. The November returns are estimates of the outcome of the crop in direct comparison with the previous one. They are made during the harvesting of the "middle crop," usually just prior to the coming of killing-frosts in the lower latitudes, when the "top crop" is still subject to all the vicissitudes of the later season. In order to the fullest possible understanding of the crop situation, it is therefore necessary to know the character of this closing period, as to heat and sunshine, rains and wind, disturbance of harvest-labor, and yield of lint in proportion to weight of seed-cotton. Especially in relation to the latter item there were hints in November of unusually low rates of yield, which led to systematic effort to learn the whole truth in the matter; and the following questions were asked of each county correspondent:

How many pounds of lint will 100 pounds of seed-cotton make this year?

How many pounds to the hundred last year?

The estimates, which were usually made by averaging carefully the results of work of gins in different portions of the county, have been tabulated, producing the following State averages:

	Lint in 100 pounds seed-cotton.		Per cent. in '75 compared with 1874.
	1875.	1874.	
North Carolina.....	29	32.2	90
South Carolina.....	29.2	33	88
Georgia.....	30	32	94
Florida.....	27.5	28	98
Alabama.....	31.4	31.8	99
Mississippi.....	30	32.2	93
Louisiana.....	30.5	30.7	99
Texas.....	31	30.6	101
Arkansas.....	31.7	31.3	101
Tennessee.....	28.7	30.2	95

No one of the Atlantic States appears to exceed 30 pounds to each 100 of seed-cotton this year, and the average of all is very nearly 30. Last year this belt of States surpassed in figures of condition every State of the Mississippi Valley. It is shown that the rate of yield of lint to seed corresponds closely with the total quantity produced in each State of these two sections. Texas, Arkansas and Alabama make the highest averages in 1875: in 1874, South Carolina, North Carolina,

Georgia and Alabama took precedence. One pound to three, the old rule for estimating lint, appears to be substantially correct in a year of good yield; 32 pounds in 100 may be considered nearer an average figure for the best lands, and anything under 30 a poor average return. Last year did not quite reach this average on account of the poor crop in the Mississippi Valley, and the present year presents a return of 96 per cent., as compared with last year.

As an illustration of the range of county estimates, and to afford an opportunity to judge of the reliability of the State estimates, the tabulation of yield of lint of a single State, Georgia, is given :

Counties.	Lint to seed-cotton.			Counties.	Lint to seed-cotton.		
	1875. Pounds.	1874. Pounds.	Percentage '75 to '74.		1875. Pounds.	1874. Pounds.	Percentage '75 to '74.
Hart	29½	31	95	Floyd	30	33	91
Gwinnett	33½	33½	100	Fulton	32	33½	95
Oglethorp	28	33	85	Glynn	20	20	100
Hancock	28	33½	84	Twiggs	30	33	91
Douglas	33	32	103	Muscogee	31½	31½	100
Gordon	31	33	94	Talbot	30	30	100
Milton	30	33½	90	Chattooga	30	33½	90
Jackson	33½	33½	100	Harris	33½	33½	100
Walton	33	33	100	Cobb	30	31½	90
Hall	33½	30	111	Montgomery	33½	30	111
Clinch	30	25	120	McDuffie	30	33	91
Cherokee	30	33½	90	Terrell	30	33½	90
Upson	27	34	79	Coweta	31	31	100
Early	30	33	91	Macon	28	30	93
Clay	29	30	96	Catoosa	33½	35	95
Laurens	30	33	91	Carroll	30	33½	95
De Kalb	30	33	91	Madison	31	30	103
Liberty	30	33	91	Murray	33½	35	95
Dougherty	29	33	88	Mitchell	30	33	91
Telfair	29	33½	87	Columbia	25	31½	79
Dodge	30	33	91	Forsyth	30	32½	92
Marion	33½	33½	100	Decatur	25	33½	75
Wilcox	29	30	96	Lincoln	27	30	90
Thomas	27	33½	81	Elbert	30	33	91
Walker	28	33½	84	Lumpkin	33½	30	111
Schley	30	32	94	Dooley	28	25	112
Sumter	30	33½	90	Johnson	31½	31½	100
Worth	25	32½	77	Stewart	30	31½	95
Taliaferro	33½	28½	117	Dawson	30	32	94
Troup	33½	32	104	Colquitt	28½	31	92
Whitfield	30	33	91	Pickens	30	33	
Jefferson	32½	33½	97				
Warren	30	33	91	Average	30	32	94

While a decrease in proportion of lint is the rule in the Atlantic Coast States, there are exceptions, as the Georgia returns show. In North Carolina three counties, Chatham, Guilford, and Rutherford, return the same as last year, and one, Alexander, gives a greater yield; the season having been unusually favorable, and the lint better in quantity and quality. In South Carolina the yield of lint was better in Richland, and as good as in 1874 in Edgefield. Putnam and Gadsden, in Florida, on account of a dry and favorable season, report the yield as good as in 1874.

In Alabama the yield was equal to or better than that of the previous

year in one-third of the counties. Fully five-sixths of the counties of Mississippi return a smaller yield. Nearly one-half of the returns from Louisiana indicate a proportion of lint equal to that of 1874; and in Arkansas and Texas returns of like character slightly predominate. A reduced yield is indicated in Tennessee in more than half the counties. It may seem unaccountable that there should be local results so opposite in the same latitudes and vicinity, but the facts are equally diverse with reference to moisture, sunshine, length and fineness of fiber, and quantity of crop. An examination of extracts from remarks of correspondents, which conclude this report, will afford much light upon these local differences.

The reduction of lint in proportion to seed is attributed to various causes. Anything preventing the development of the boll will reduce the relative amount of lint, which is last in order of maturation. Too much moisture after drought may give a sudden impulse to the growth of wood, and perhaps size and numbers in fruiting, but the bolls are slow to open and deficient in lint. Drought may so injure the plant as to prevent proper development of boll. The use of fertilizers, especially the phosphates, tends to increase the weight of seed, as in the case of our cereals, and our returns give proof of such result; in one county unfertilized fields yielding five pounds of lint more per hundred, or 17 per cent.

Quality.—In nearly three-fourths of the counties of the Carolinas the quality is represented as inferior to that of 1874. A few reports make the staple shorter, with quality equal in other respects; one indicates shortness of fiber, with less yellow cotton.

Georgia has the same proportion of reports of low quality. The counties in which the staple is better are Hart, Early, Liberty, Telfair, Dodge, Taliaferro, (decidedly better,) Montgomery, Madison, and Lumpkin. Other reports indicate an equality with the previous crop. Similar statements come from Florida, some much worse, a few better, and some the same as in 1874.

Coming to Alabama, just half the reports indicate worse quality, some making the depreciation as much as 20 per cent.; and of the remainder rather more than one-half return better quality, a few of them "much better," or "decidedly better." Mississippi, which reports as low a yield of lint as Georgia, also returns as much depreciation in quality. Nearly all of those returning better quality are upland counties. Injury by storms is reported in some cases.

A larger proportion of returns of good or superior quality come from Louisiana, yet they are less than half of the entire number. Very nearly half from Tennessee indicate good or better quality, but the average indications point to a slight reduction in the quality of the whole crop.

The only States in which the quality of lint is improved are Arkansas and Texas. In the former three-fourths of the returns indicate superiority, and in the latter fully four-fifths. In some counties in Texas the average quality is a full grade higher than in 1874, and the degree of improvement ranges in other counties from 5 to 50 per cent. The staple is very generally reported longer and finer.

Progress of gathering.—Another point upon which careful estimate was required was the proportion of the crop gathered on the 1st of December. The progress of gathering was returned as farthest advanced in South Carolina and the latest in Mississippi. The percentage gathered is returned as follows: North Carolina, 89; South Carolina, 95; Florida, 93; Georgia, 92; Alabama, 87; Mississippi, 75; Louisiana, 83; Texas, 94; Arkansas, 76; Tennessee, 78. The average for the crop

is 90 per cent., leaving one-tenth of the crop ungathered on the 1st of December.

Weather.—The meteorological conditions have been somewhat unusual, and their effect somewhat difficult to calculate. The growing season has been of almost unexampled length, and yet the weather has not been quite in a medium degree favorable for gathering, and scarcely for maturing. Many reports in all the States represent highly favorable conditions of maturation and harvesting, but a still larger number in every considerable section are unfavorable. Not a few in all the lower belt of States report an absence of killing frosts up to the date of return, and several report the first destructive frost on the 7th or 8th of December; and yet so late a season, instead of increasing the crop, is held at many points to be the cause of diminished yield. This apparently anomalous result is not unreasonable the present season in those large districts of best production, in which the growth of wood was late and too vigorous, and moist and growing weather continued long after the usual time for the decay of the stalk and maturing of the top-crop. Even in December blossoms and young bolls were present, and ripening was delayed until heavy frosts appeared, followed by blasting storms, which not only prevented maturation, but destroyed much of the open fiber.

Rains have been too frequent and rough storms have occurred to a greater extent than last year, tending to diminish the expected product and delay the work of the pickers.

The effect of a long season, increasing the yield on uplands and advanced growths generally, with the drawback of a lack of frost to stop growth and hasten ripening; and, *per contra*, the injurious results of storms and unfavorable weather, may together, if carefully analyzed, be held to indicate a somewhat less favorable autumn than that of 1874.

Total quantity produced.—It is always difficult to combine the records of the most accurate crop-history, taking into due consideration the germination, the stand secured, the cleanness of weeding, temperature, drought, storms, floods, worms, frosts, efficiency of labor, and other causes of success or failure; yet upon a careful analysis of all these influences depends our knowledge of the crop prior to its actual presence at the cotton-marts of the country. The Department returns made an increase of about 2 per cent. in the area of the present crop. The record of condition for five months, from June to October, furnishes another important element in the calculation. It would not do in every season to rely upon an average of condition for the season, especially if there was a continual upward progress in the record of one season, and a downward movement in the other, with which comparison is made; but the past two seasons have a substantial agreement in that respect, and the averages of each ought to bear some relation to crop-prospects in October.

We find the average of this period in 1874 to be 83 per cent. of a standard of unimpaired vitality; in 1875, 93.5 per cent. As the crop of 1874, with fine autumn weather and late frosts, was 3,833,000 bales, the expectation in October on this basis would be 4,317,000 on an equal area, and 4,403,000 on the actual area. Then it is found that the yield of lint is 4 pounds less than last year on every 100 pounds of seed-cotton, which causes a reduction of 176,000 bales, leaving the prospect 4,227,000 bales. But it would appear that the present season has been less favorable than last year for perfecting and opening the bolls, and for gathering; and yet the delay of killing frosts has been remarkable, tending in some situations to increase of yield, and in others to continued growth of the whole plant rather than the perfecting of its fruit, thus complicating the

comparisons of ultimate results. In some cases the greenness of the plant in December is cited as a cause of diminished yield by the sudden loss of long-delayed fruitage by violent storms. These facts make it difficult to estimate the extent of the depreciation from unfavorable weather. Three per cent. ought not to be unreasonable, and this would leave 4,100,000 bales; if four per cent., 4,058,000 bales; if only two, 4,143,000.

The November returns, as before stated, giving an aggregate of local estimates, are each year somewhat lower than the teachings of the returns of condition. They are about twelve per cent. greater in 1874 than in 1875, and if we reduce this increase one-half in view of the difference in the weather, and the yield of lint not taken into consideration on the first of November, and add 6 per cent. to the crop of last year, we have 4,063,000 bales. This is in harmony with the result deduced from the returns of condition above.

It is our aim to give as accurately as possible the history of the crop, and not to make bets on the actual result, or attempt to fix to a bale the amount to be ginned and sold, as a small portion of the crop is still liable to various contingencies before marketing. But it is proper to give an idea of the substantial purport and meaning of our returns; and we have no hesitation in interpreting them to mean a crop of about 4,100,000 bales, with small probability that it will either exceed or fall short of that amount more than fifty thousand bales. If it should vary by wider figures, we must acknowledge that by so much have our returns failed to fathom the inscrutable.

We make somewhat copious extracts from the notes accompanying December returns, to give all the light possible upon the later aspects of the crop:

NORTH CAROLINA.—*Pitt*: While the acreage this year was 100, the "final estimate of the quantity to be expected will not exceed 66 $\frac{2}{3}$." *Wilson*: Owing to a small increase in acreage the crop is about 2 per cent. larger than last year; yet the yield is not so good, the staple being a little inferior. Ten thousand bales is the estimate for this year's crop in this county. *Edgecombe*: All lint made since the August rains is; as a rule, inferior. *Brunswick*: On account of late spring and very early fall, also of the very dry months of July, August, and September, there are now a great many half-matured, open bolls on the stalks. *Beaufort*: The season has been very wet, particularly during November. The last picking has fallen very much short of what was anticipated. Those who secured an early stand have made fair crops, but those who were late—and their number is unusually large—have made only two-thirds of a fair or average crop. I am now of opinion that the acreage was a little larger than first reported, and that the crop of this year will be only about 8 per cent. short of that of 1874. *Hertford*: The lint is shorter than last year's; its quality is considered not so good. *Duplin*: Cotton on stiff lands has made an average crop; on sandy lands, scarcely half a crop. One-half the lands planted in cotton are fine sand-lands. Nearly all cotton has been sold, and over one-half the farmers still in debt for making it. *Monroe*: The cotton-crop is at least one-third short of last year, and the yield on an average is 1 pound of lint to 3 $\frac{1}{2}$ pounds of seed-cotton. *Union*: The heavy frost has decreased the average in this county at least 15 per cent. *Mecklenburgh*: The frost has injured our crop about 10 per cent. This year's crop is about three-fourths of that of 1874. Over one-half of the crop in this county has been sold. *Nash*: The droughts of June and July retarded the growth of the plant, especially in the stiff lands; they were also injured by the frost. The indications now are that there will be a reduction in the acreage in the coming season of at least 23 per cent. *Pasquotank*: The frosts came earlier this season than usual, and a large part of the cotton was ruined. *Greene*: There never were so few pounds of lint to 100 pounds of seed-cotton. The seeds are extra large; three of this year's crop are equal in size to four of last. This is the case throughout the county. *Cumberland*: Owing to floods of rain in August, crops are short, of inferior quality, but nearly all saved by December 1. *Alexander*: The fall being very favorable for gathering cotton, the quality and quantity of the lint is better than last year. *Pamlico*: It is not an exaggeration to report that this is decidedly the worst cotton-year ever known, both as to quantity and quality of the crop. *Wayne*: I think the quality of this year's crop equal to that of last. *Gaston*: The crop is short of last year's. October frost caused a backwardness in the crop that few were prepared for. The early picking-season was delightful, insuring a large per cent. of strictly fine cotton. The quantity of stained or frosted cotton is double what it was last year. *Ran*

dolph: More cotton raised this season than last, owing to increased acreage. The cotton-factories, five in number, on Deep River, which runs diagonally through this county from northwest to southeast, furnish a ready market for the most part of the cotton raised; and while the prices of the staple keep up to the prices they have been for some time, there will be, from year to year, an increase in its production. But I should observe that these factories also work up cotton raised in other counties. The quality of the lint is not so good as last year's, on account of early frosts and the wet season.

SOUTH CAROLINA.—*Chester*: Too much rain in August caused too rank a weed; and our farmers assign as a cause of short crop, early killing frosts. *Neuberry*: Owing to the drought during the fall, the cotton suffered very much. The lint is shorter than usual. There is a great difference in the quality of different varieties. *Peeler* cotton produces longer lint, and of a better quality. *Union*: We have had an unusually favorable fall for gathering cotton, but the season was not propitious for the development of the lint. Samples are clean and white, but the lint is not so long or so fine as last year, and much lighter, as compared with the seed. Farmers differ as to the cause of this. Some attribute it to a long dry spell, others to a long wet spell. *Fairfield*: Cotton has been nearly all saved in good order. Some late picking badly stained by frost. *Barnwell*: The later growth, which promised an additional amount in September, did not mature. There was not lint-cotton enough in the bolls to open them. This was caused by drought, and accounts for the worse quality and lesser quantity of lint-cotton to seed-cotton, as compared with last year. From different samples I have ascertained, by careful weighing, that the lint will not average more than 29.4 pounds. *Williamsburgh*: The cotton-crop here is one-third short of last year's. It has been the most unfavorable year of any in an experience of twenty-three years. Wind, storms, floods, and drought have all combined in the disasters of the year. *Greenville*: The first picking gave about 28 pounds to the hundred, the second about 30 pounds. "It don't third itself this year." *Spartanburgh*: Farmers complain that the staple is short, and that the quality is not so good. A large percentage is stained, and some of it very badly so. *Lexington*: Some lots of cotton of this year have yielded only 28 pounds of lint to 100 pounds of seed-cotton; but 30 pounds is a fair average in this county. Two-thirds of an average crop has been gathered, and this is all that can be expected. *Clarendon*: As the early-picking season was dry and favorable, the quality of the lint is better. First killing frost appeared on November 17. For nearly a month we have had rain in abundance, and what remains of the crop is badly injured. *Edgefield*: Cotton will yield fully as much lint as usual; the year has been unusually dry. The drought has no doubt affected the lint; seeds are lighter. Cotton in first-rate order for ginning, (perfectly dry;) will make 33 pounds lint from 100 pounds seed-cotton. Not much rain during picking-season to stain early cotton, and but very little late cotton to be affected. The quality is much above an average. *Marlborough*: The cotton-crop is certainly one-fourth short of last year. In my experience of thirty years, in cotton-planting, I have never known such poor lint as compared with the seed-cotton. The result is disastrous to all. Short crop and low prices.

GEORGIA.—*Pickens*: We have been raising cotton in this county for only about three years. The climate is not suitable; we are compelled to use fertilizers to mature the crop. This season was not so favorable for cotton as last. *Stewart*: The quality of cotton is poorer than it has been for a number of years, and the yield less than was expected. The top crop has not opened enough to be estimated, owing to the warm, cloudy, and damp weather we have had for over a month. No frost as yet. *Gwinnett*: After paying for ginning, the yield of lint from seed is one-third. This yield is better than in former years, when the ratio was as 1 to 4. With improved varieties, and better culture and fertilization, we have this result. The season for gathering was better last year than this; less wet weather, but the yield of lint is equally good this year. *Oglethorpe*: Prices being so low, it is extremely difficult to have the cotton picked. We have been paying 40 cents a hundred and two meals per day; but stained cotton, such as the present, is hardly worth the picking. *Hancock*: I have never heard so much talk about cotton yielding short as this year; 1,500 pounds seed-cotton will not make over 450 pounds of lint; last year gave 500 pounds. *Milton*: Cotton was injured in quantity and in quality by the scorching sun in July, causing the lint to be short and light. *Jackson*: We have poorer cotton this year than last; "storm-cotton" is plentiful. *Forsyth*: Lint is short this year, and there is more stained and frosted cotton than last. *Fulton*: The yield is 20 per cent. below the general expectation of all well-informed planters, and 40 per cent. below the general estimate. *Dodge*: The winter has been very mild, and has caused our crops to gain at least 15 per cent. *Hall*: Cotton opened well; a fine fall; farmers industrious. Crop generally gathered; but little yellow cotton. *Laurens*: The quality of the crop is very much worse than last year. About half is stained and dirty from rains. Last year's crop was gathered without injury, and was very clean. *Telfair*: The lint is better than last year, but does not yield so much. All disposed of last year, and generally before it is made. *Decatur*: Cotton-seeds are large and heavy; lint is shorter and frequently stained. All planters who hired laborers and boarded them will lose money. *Lumpkin*: Not much cotton raised in this county; only 42 bales last year, though this year's crop is much better. *Dooly*: Crop is gathered early; quality better than last year; no storms. *Murray*: As the fall was dry last year, the seed was lighter than usual, and 100 pounds of seed-cotton made about 35

pounds of lint. This year the quality is at least 5 per cent. better than last; staple is fine and longer. *Madison*: With regard to the crop of this county, I have recently changed my opinion. I think that the present crop will perhaps equal last year's. *Terrell*: The top crop, which promised so well a few days ago, is now being ruined by the continuous cloudy and wet weather. No sunshine in ten days. Yield will be very small and of a poor quality. *Carroll*: Cotton was injured by drought and rust; so much so that it opened prematurely, thereby shortening the lint and causing it to be light. The crop in this county will not exceed 65 per cent. and is all gathered; and, considering the shortness of lint and the price, it is a failure. The price will not warrant the making. To make and gather the crop costs $12\frac{1}{2}$ cents, and the ruling price has been only 11 to $11\frac{1}{2}$ cents. *Jefferson*: Ginners inform me that where fertilizers were used, 100 pounds of seed-cotton barely yielded 30 pounds lint, while that without fertilizers made 35 pounds or more. They say they have made the test in many cases. The difference is accounted for by the heavier production of seed when fertilizers were used, and I think their theory is correct, having tested it in my own crop. *Taliaferro*: The very favorable weather, for development of lint, during the months of September and October, has made the average of lint-cotton higher, both in quality and in quantity, than last year; and yet the total crop will only reach 75 per cent. of last year's. *Troup*: The grade of cotton is not so fine this year as usual, on account of drought in the summer and rain in the fall; staple is short and stained with dirt. *Worth*: Dry weather, together with rust, have ruined cotton. Many planters who planted the same land, the same number of acres, with the same culture, and who made ten bags of cotton last year, are cut off to four bags this year. *Sumter*: The late crop is being injured by the continued cloudy weather, which we have had for the last twelve or thirteen days. To-day, December 2, a fine rain. *Walker*: The cotton crop is nearer a failure this year than any year since the war. The weed looks well, but, owing to the wet weather in October and September, it opens poorly. *Thomas*: It is still warm and wet. There are plenty cotton blooms and bolls; think they will not open, but rot. If it would turn cold, probably some bolls would open and make tolerable cotton. *Wilcox*: The quantity of cotton made this year in this county is as 115 compared with last year (1874.) It does not yield quite so much lint. Up to this date we have not had a killing frost. Cotton is still blooming in the field; almost all, however, has opened and is gathered. *Marion*: There is but very little cotton in the fields at this time, not more than one-tenth, if that much. We have had no frosts, except a light one in October. Although we have had a late fall, cotton is not improved; excellent weather for gathering. *Dougherty*: The late crop or second growth, which three weeks ago promised a good yield, has nearly all been destroyed by rain and cloudy weather, the sun not having shone in two weeks. *Liberty*: We have as yet had no killing frosts to destroy the cotton before maturity; the staple, therefore, is better. More attention also has been paid to the judicious selection of seed. The Cheatham cotton-seed is very productive. *Early*: Since September 1, there is in many places a wonderful crop of new bolls which are opening slowly, and if most of them open, the yield will be increased to 75. The weather has been and still is warm, cloudy, and rainy, and cotton is still blooming, which retards the opening of matured bolls. A sudden frost would close up the cotton-crop. *Walton*: The product of lint from 100 pounds seed-cotton varies materially. The average is about 33 pounds, while some kinds of cotton will give nearly 40 pounds. Other kinds, on account of the large size of the seed, will yield little over 25 pounds. As a general rule, as the seeds are less in size, the sample is better, hence all cotton-planters would be benefited by raising small-seeded cotton. The cotton-crop is fully equal to that of last year in all respects, and in some localities better. The entire crop is open to the top; very little stain from frost.

FLORIDA.—*Clay*: There is very little short-staple cotton made in this county; nearly all sea-island cotton. *Putnam*: So far as I can get information, there is a falling off in the amount of cotton planted from year to year. Attention is given to other crops; such as fruit. *Lery*: There has been no frost in this county this fall. More than usual, the weather has been damp. Some fields of cotton are still green and in bloom. The weather has been warm, but is now cooler, (December 8.) *Columbia*: Of the cotton planted in this county, 75 per cent. is sea-island. Upland made 33 pounds of lint per 100 pounds of seed-cotton. The first killing-frost appeared on the 9th instant. *Leon*: Our cotton stopped bearing in July, and looked as if it would die. The rains, beginning August 1st, caused a new growth, and, the weather being favorable, a very heavy top-crop was made, which is now opening. If the weather remains favorable for two weeks longer we will get enough to bring the crop to 80 per cent. of last year. No frost yet. *Suwannee*: The protracted drought of last summer has greatly injured the cotton-crop in this county; and yet cotton is very cheap, greatly discouraging the cotton-planters. I think that many will plant less hereafter, and some will abandon it altogether; as it costs more to raise the cotton than it brings. I am speaking of short-staple cotton. *Gadsden*: One hundred pounds of seed-cotton will rarely give over thirty pounds of lint any year, and the present is no exception. The usual estimate of one to three is entirely too high. The quality of lint this year is better than last. Cotton-picking in this county closed on the first of November. The bottom and middle bolls opened freely; labor was abundant. The promise of a top-crop was very flattering, but has not been realized, as the bolls did not open. On clay-lands the crop of top bolls is the heaviest I have ever seen, in an experience of over forty years. Could we have had clear weather and a

killing-frost the result would have been a large increase of the yield, but the reverse has been the case. The entire month of November has been damp and murky, and there has been no frost sufficient to check vegetation. *Jackson*: The progress of the crop was unpropitious from the start for a successful yield. At times during its growth appearances indicated a good crop, but disasters have made it poorer than any crop ever before. The full development of the boll is dependent upon the cultivation and regularity of the seasons. This year it was defective from irregularity in growth and progress to maturity, consequently the staple was irregular in length of fiber, and the yield a very poor crop in quality. The seeds were not full, coming out of the gin with defective lint adhering to them. Product: 33 to 35 pounds lint to 100 pounds seed-cotton; a little better last year. The crop of 1874 was 80 per cent.; that of 1875, 64 per cent. The top-crop, expected to be made and gathered, has been destroyed by wet weather and other causes.

ALABAMA.—*Dale*: Much more cotton gathered than was expected, even on the 1st of November. No frost yet to kill cotton, December 8. *Ballock*: The fall has been unusually mild, and favorable for gathering the crop. *Hale*: The crop is the best since 1870, but we have had an unfavorable fall for picking; owing to heavy rains the quality is in the main bad; last year very good. *Lawderdale*: The crop is the shortest since 1866; the weather has been so wet that the crop could not be gathered in time, hence the quality is very inferior. Very little of the crop will class above good ordinary. *Jefferson*: For the last four weeks, up to December 11, we have had damp weather, but no hard rains. Had the weather been dry and favorable the cotton would all have been gathered. *Shelby*: The crop at first was superior in quality to that of 1874, but the excessive rains and winds of September have stained the fiber, and have done other material injury. *Colbert*: Our cotton-crop this year is not so good in quality as last year's; much of it will not open on account of injury from frost. When the frost came (no sooner than usual) the cotton was full of sap, and growing. *Montgomery*: Drought has cut off the cotton-crop about 25 per cent. Late winter; no frost to kill cotton yet. The weed is still blooming and opening. *Franklin*: Farmers have been unusually slow this year in gathering cotton. It is owing to the almost incessant rainy weather since August. Cotton is ruining our country; there is no money in it here. *Buler*: We have had no killing-frost yet, and cotton is still blooming. In some places there are many grown bolls on the stalks, but very few will open. It requires warm, dry weather to make cotton open so late. This year 100 pounds of seed-cotton will only make 29 pounds of lint; last year 33 pounds; quality inferior. *Henry*: July drought nearly killed our cotton. The rains of August brought on, in appearance, a very fine top crop. It has been very slow to open, and is very light when gathered. *Clarke*: The cotton-crop on the uplands is very short this year, on account of a long drought. The low lands, where they have been too wet for years past, have made fine crops; in some instances a bale of 500 pounds to the acre. In many upland fields there is a second growth, though little can be expected from this. *Cathoun*: The yield of lint is not quite so good as last year. Wet weather during the last month (November) has damaged the quality. *Greene*: The weather was unusually bad in November. Wind and rain threw much of the cotton on the ground. *Limestone*: This portion of North Alabama has made the lightest cotton-crop known for years, if ever before. I think this county will not average more than a bale for every 10 acres. Some of my correspondents say a bale to 15 acres, others a bale to 6 or 7. The average of lint to 100 pounds seed-cotton is about 30 pounds; last year 32 pounds.

MISSISSIPPI.—*Smith*: The cotton in the fields will be worse than that already gathered. Continued wet weather (warm rains) has materially injured the cotton still in the fields. The seeds are sprouting. The yield will be less than last year and the quality inferior. *Wilkinson*: Continued cloudy, damp, foggy weather for five weeks, with frequent rains, has destroyed much cotton, greatly reducing the November estimate and seriously injuring the quality. *Lincoln*: There is much damaged cotton, caused by rains during the month of November. The latter part of November was particularly unfavorable for gathering cotton: that gathered since the 15th is in a very dirty and trashy condition. *Kemper*: I have remarked a falling off in the quantity of lint this year, greater than I have ever noticed before, and from that alone infer that there will be a greater reduction in the crop than was anticipated. *Noxubee*: For the last four or five weeks the weather has been very wet. Much cotton has been gathered and housed damp. In the black lands a great amount of cotton is yet in the fields, and, if the rain continues, half will be lost. The crop, if gathered, will be 5 or 10 per cent. better than last year. *Choctaw*: Not more than 80 per cent. gathered, in consequence of continued wet weather for three weeks. Cotton at present in the fields is injured; in low lands, almost ruined. *Lovendes*: Continued wet weather since the 10th of September has very much retarded the gathering of the cotton-crop, and has injured the quality. *Pike*: The cotton-crop is nearly gathered in this county. Owing to heavy rains picking has been stopped, and what is yet to be gathered will be very much damaged. Nobody holds back this cotton from the market. *Amite*: This season has been unusually wet for gathering. The crop of 1875 will fall short of what was expected in July and August. Excessive rains caused great losses along the streams. *Neshoba*: The quality is inferior, owing to much rain-fall during the last six weeks. *Rankin*: Rainy, damp weather has hindered picking and caused some rot. Weather growing worse, and threatening to be disastrous to cotton

still on the stalk, as also to a great part that has been gathered wet. *Lafayette*: We shall certainly make a third more cotton than we did last year. There is yet one-third of the crop in the fields. The late rains have injured it in quality as well as in quantity, much of it having been beaten out and is now on the ground. Killing-frosts did no injury; no stained cotton this year. *De Soto*: Hundreds of acres of cotton not picked, and from one-fourth to one-half of that is lost. I think, at least 25 per cent. more cotton has been made this than last year. *Grenada*: The staple is longer and better, but is not saved in so good condition as last year. This is owing to heavy and continued rains. It is estimated that from one-half to two-thirds of the crop is already gathered; but for the cause above given the remainder will be lost. *Tishomingo*: We were much deceived by the extra growth of the plant, expecting an additional amount of lint. Frost, rains, and winds have injured the crop about 10 per cent. *Coahoma*: Cotton opened up early this season, but on account of wind, rain, and political excitement has been gathered slowly; a larger proportion than usual has fallen out and is lost. *Chickasaw*: On account of heavy and constant rains during November, we could not gather cotton more than two days in the week. Much cotton has, therefore, been entirely lost, and the remainder is greatly injured. *Monroe*: Owing to the excitement during the recent election, and to unprecedented wet weather, it is impossible to say how much of the present crop will actually be saved. If the weather remains bad, but very little of the crop still in the fields can be made, as much of it has already been blown out and beaten into the ground. *Winston*: All the cotton that was gathered during the last month, and that which is yet to be made, has been badly injured by the rainy season, which set in much earlier than usual. Some of the cotton in the fields is hardly worth gathering. *Madison*: Elections and sickness among the hands during the fall have retarded cotton-picking. *Washington*: In this county to day (December 11) a great deal of cotton is in the field still untouched, so scarce is labor. *Lee*: Much cotton is yet in the fields. The crop in this county was at one time twice as large as last year's; but disasters may bring it down to near the same. One-half is now in the fields, and nothing but the best weather can save half of that. A great quantity of cotton is on the ground. Picking is worth \$1 per hundred; hands hard to get. High, strong winds uncovered the cotton-pens and let in the constant rains until large quantities have rotted. Gins are making bad samples, as damp cotton will not gin well. Roads are almost impassable, requiring four oxen to haul a bale.

LOUISIANA.—*Rapides*: Much cotton has been lost by heavy rains, and the quality of that which remains is very much injured. Up to date (December 7) there has been no killing frost; cotton is still green. *Claiborne*: The late or second crop has not opened as was expected. The first killing frost appeared last night, December 9. *Concordia*: We have had two weeks of very bad weather; during the last ten days almost incessant rain. Damage to cotton in the field very great, as all of it is open. No killing frosts as yet. *Saint Landry's*: In consequence of too much rain during October and November, a great portion of the cotton is very inferior. Two weeks of fair weather will end cotton-gathering. *Jackson*: The cotton-crop in this parish is nearly all picked, and while the actual yield is 10 per cent. greater than that of last year, the quality is inferior. This is caused by the storm in September, which threw down the stalk into the sand and dirt, and not only occasioned a loss in the aggregate quantity, but did much injury to the staple. The weather throughout the picking-season has been all that could be desired. *Union*: In this parish the season has been unusually favorable for cotton-picking. The loss occasioned by the storm on September 17 is about all the farmer has sustained. We have had no frost as yet (December 1) to kill the plant. *Texas*: Last year the crop was greatly below an average, owing to a general overflow. This year the season for growing was fine, and the yield full and abundant; but the gathering-season has been bad, and picking is hindered. Notwithstanding this, I think the quantity gathered will be equal to that of any year since the war, except 1870. *Washington*: The season for picking has been remarkably fine, and many farmers were agreeably disappointed in increased yield, as the weather had been warm and dry. Cotton continued to mature till the frost of the 7th of December. *East Baton Rouge*: The almost unprecedented warm and favorable weather during October and November considerably improved the cotton-crop and prolonged the picking-season. The plant is still blooming. As yet we have had no killing frost. I think the product will be 10 per cent. better than estimated in November. *Franklin*: The estimate (31 pounds lint to 29½ last year) is based on actual experiment. Incessant rains, and damp, cloudy weather, materially affected cotton, both in quantity and in quality. A considerable percentage sprouted in the pod and changed to a bluish cast. First killing frost, accompanied with thin ice, appeared on December 5.

TEXAS.—*Lampasas*: The season has been very favorable for cotton-picking. *Polk*: The great storm did considerable damage, but the estimated loss as to quantity was too high. The quality, however, is at least 25 per cent. below last year. *Burleson*: Since the storm of September 17, the weather has been favorable to the opening of bolls and the gathering of cotton. The yield is good, and nearly the whole crop saved. *Titus*: No rain and but light frosts this fall have been propitious for gathering cotton. Over three-fourths of the crop gathered and ginned. Lint entirely free from dirt; it is longer, and the fiber finer, than for many years: caused, I think, by the dry summer and fall. Crop of 1875 is over an average by 20 per cent. *Coryell*: The season for picking cotton has been remarkably fine. No rain from July 24 to November 15; in consequence, the crop was picked in fine

condition. The crop was full, the average in this county being half a bale (250 pounds) per acre. But a small per cent. yet in the field, and by the 15th of December the entire crop will have been picked. *Aransas*: The entire crop of our county for 1875 has been or will be picked. *Fort Bend*: For several years the cotton-worm has injured the quality of the cotton; their not appearing this year, the cotton is cleaner, has less motes, and grades better. From some cause, not well defined, the same amount of seed-cotton yields less lint this year than last. *Bosque*: The fall has been remarkably favorable for gathering cotton: the crop is nearly all out, but not yet ginned. Most of the crop has been gathered pretty free of trash, and as the staple is of better quality than usual, the proportion of good to inferior cotton this season is quite large. Very little low grades this year. The yield in lint is 32 pounds to 100 pounds seed-cotton. This low figure is accounted for by the unusually well-matured, heavy seeds, leaving less lint. *Fannin*: The crop will be housed by February 1, should the weather be at all favorable. The prices for gathering have been from \$1 to \$1.25 per hundred. *Red River*: The early picking will make 33½ pounds lint to 100 pounds seed-cotton, but the average will be about 30 pounds, the same as last year. The season up to December 1 has been beautiful, and almost without rain: in consequence, a greater proportion of the better grade will go to market. The crop is yielding largely; about 50 per cent. is gathered. *Bowie*: This has been a very propitious season for cotton-picking. The weather has been a continuation of Indian summer, until within a few days. Cloudy weather has set in, and now a norther is blowing. *Marion*: There have been 1,500 bales more cotton received at this port than at the same time last year. *Houston*: Our cotton was injured by drought and the storm on the 16th and 17th of September. Since the storm the fall has been, in every particular, favorable to cotton. No frost as yet. Second crop is opening finely; staple very good. *Montgomery*: Cotton gathered before the storm (September 17) is of superior quality: that picked since is not near so good. *Harrison*: It is remarkable that as yet (December 2) we have had no frost in the higher lands of this county. On my farm the tobacco, cotton, and tomato leaves are still green. Since the storm (September 17) we have had good weather for picking. *Wood*: Owing to the dry fall the seeds are small and light, while the lint is long, and turns out well. *Collin*: The present has been the most favorable season for gathering the cotton-crop in many a year. All will be housed before December 25. *Waller*: The storm filled the seed-cotton with dirt, so that the bales were recognized as "storm-cotton." A sample just taken from the bale is classed "ordinary." A little handling improves it and makes the sample a grade better. *Grayson*: This has been the best year for cotton since the close of the war. Our crop will run from three-fourths to one and a half bales per acre: last year scarcely half a bale was realized; this year the seed is very heavy, while the seed was very light, scarcely half matured, last year. Our acreage is about the same; if anything, less; yet we will double the crop of last year. *Washington*: Only one or two frosts yet, and not severe enough to kill growing cotton-bolls. We estimate, on an average, 1,600 pounds seed-cotton for a 500-pound bale. *Dallas*: The crop of 1875 is at least 50 per cent. better than that of 1874. First killing frost, 8th of November, ten days later than usual. Fall and winter unusually dry. Cotton all matured and open; will all be gathered. We estimate 400 pounds lint per acre; quality unsurpassed. *Victoria*: But for the storm in September the crop would have been the best since '69, the number of acres planted being the basis of comparison. *Smith*: These questions (referring to the cotton-circular sent out by the Department in November) are certainly well-timed, and would bear repetition the first week in January. It would give your correspondents an opportunity of reviewing and correcting their year's work. The seed this year is well matured and heavy, in consequence of the late rains. Staple remarkably good. One cotton-buyer says he has not seen a bad staple this year. There is some sand in it, however, from the late storm. *Liberty*: Weather most favorable for cotton-picking, and, but for the storm, the staple would be very superior. Cotton was picked off the ground and piled together, making the whole an inferior sample. *McLennan*: Seed-cotton varies in weight with the season. Early in the season the seeds are green and heavy, and it requires more seed-cotton to make a given amount of lint than later when the seeds are dry and light. *Gillespie*: To-day, December 7, we had the first frost. *Austin*: The September storm having destroyed the top crop and part of the ungathered cotton, (about 25 per cent. of the whole crop,) the difference between the present and last year's crop is about 25 per cent.; otherwise the crop would have been about the same. The quality is much better, doubtless, on account of the dry weather, which enabled farmers to house the cotton clean. Crop all gathered; many girls have been idle for weeks. The smallest crop in proportion to the acre planted for many years. *Bell*: The Hurlong variety will give 1 pound lint from 2½ pounds seed-cotton, or 3¾ pounds lint to 100 pounds seed cotton. Quality about the same as last year. This county will make about 15,000 bales this year; over half gone to market. Home prices from 9 to 11 cents for best grades.

ARKANSAS.—*Saint Francis*: Cotton-crop for 1875 will fall far short of expectation. It is hard to gather, and, when gathered, the sample is very inferior. Owing to blight, bolls are very small. *Boone*: Dry weather for the last three months has been favorable for the opening of the crop and for picking. *Izard*: The fine season for picking has been counteracted general sickness, on account of which two-thirds of the crop is ungathered. *Miller*: The

all has been unprecedentedly good for picking cotton, and the crop on the bottoms is the best I ever saw. But the hands are slow in picking, and, as the rains are now set in, about one-twentieth of the crop will waste on the ground. *Jefferson*: This fall has been unusually good for picking cotton, which is nearly all gathered. Lint much stronger and heavier than last year. *Prairie*: Until within the last ten days, we have had the best of weather for gathering and putting in our crops. *Bradley*: Cotton better matured than last year, hence better quality; weather remarkably fine; no killing frost yet; cotton still opening. *Monroe*: The unusual heavy rains for the last ten days have injured the cotton now in the field at least 15 per cent.; weather still unsettled. *Franklin*: Number of pounds of lint to 100 pounds seed-cotton averages 32½. About 30 pounds was last year's average; quality much better this year; at least 90 per cent. already gathered. I am confident 5,000 bales will be made in this county. Compared with previous crops, I estimate this year's at 100 per cent. full. The season has been favorable for gathering, and labor abundant, hence cottons gathered in good condition. *Yell*: The season for picking has been the best for years and still continues good. The crop gathered so far is as good as can be, and the staple fine. *Fulton*: We have had remarkably favorable weather for gathering the crop, but sickness has caused a greater or less hindrance. *Crittenden*: The price paid per hundred for picking cotton is from \$1 to \$1.25, and yet there are thousands of laborers around Memphis, Tenn., that cannot be induced to work; hence we will be late in getting in our crop; loss considerable from inclement weather. *Dallas*: Cotton-fiber is stronger than I have seen it for ten years. An unusually large per cent. has been gathered free from dirt and sand. Crop nearly all housed. The answer (175 per cent.) to the question, "What per cent. of the actual crop of 1874 will be gathered in your county in 1875?" may appear too large, but I believe the cotton and corn crops are nearly twice last year's. *Montgomery*: In comparing this crop with that of last year we make a very good showing, as last year everything suffered from drought. The quality this year is better, because the dry fall permitted the fiber to be picked in a pure white, unstained condition. Cotton matured and opened exceptionally early, without becoming stained or frost-bitten. *Crawford*: There is now more unpicked cotton than there was at this time last year, which is owing to the fact that up to about three weeks ago very little wheat was sown, but since this time wheat has been put in to the neglect of cotton. As the weather has been dry and favorable for picking, the cotton is cleaner, seed is lighter, and, on the whole, lint is considerably better than last year.

MISSISSIPPI.—*Maury*: This county usually makes from 18,000 to 20,000 bales of cotton; this year the yield will not exceed 5,000 bales. *Dyer*: In consequence of wet weather and frost, which damaged the cotton-crop very materially, the yield of this county will not exceed last year's. The crop is about half an average good crop. *Weakley*: Our cotton-crop was very badly damaged by frost, and recent rains have beaten out many of the bottom bolls into the ground, thus soiling and staining a heavy percentage of the crop. *Giles*: I am a native Tennessean, fifty-five years old, but never have seen such a complete failure of the cotton-crop. It required eight or ten of the best acres to make a bale. *Putnam*: The cotton-crop for this year seems to be unnatural. The bush runs up hard and spindling; bolls are small and hard, and until very recently failed to open. The reason I assign for this is incessant rains and cloudiness for nearly two months, June and July; hence the quality is inferior. *McNairy*: I have been running a gin for ten years, during which time no year produced as little lint to the 100 pounds seed cotton as the present has. All ginners I have seen say the same. Causes of this are, excessive rains while the plant was growing and maturing, and heavy, cloudy weather for two-thirds of the time since the gathering season has set in. One-fourth of the crop lies ungathered on the ground, beaten down by heavy rains and winds. *Fayette*: The yield of lint, in proportion to seed, is much better than usual. Drought cut off all late bolls. What cotton we have opened and matured early. The drying-influence of the atmosphere lessened the weight of the seed, and made the quality better. November 4 a severe and destructive wind and rain storm visited us, followed by almost continued unfavorable weather to the present time, so much so as greatly to reduce the average of the crop. The remaining portion of our crop will be less in quantity and worse in quality than any former reports have indicated. *Tipton*: The cotton-crop in my county this year (acreage 10 per cent. less) is at least 25 per cent. larger than last year. Allowing 3½ pounds of seed-cotton to one of lint, 100 pounds of seed-cotton will make 26½ pounds lint. Last year the yield was 2½ pounds, reckoning 3½ pounds of seed-cotton to one of lint. Quality is better. The low price of cotton makes laborers indifferent. Picking is backward, and recent heavy rains have done serious damage. *Hurdman*: In this county, owing to a very dry summer and fall, last year's crop opened three weeks earlier than the present one, and was all gathered by the 1st of December. This year the summer and fall have had regular rains, and more sickness prevailed among the operatives in August, September, and October than has been known here for a quarter of a century. After consultation, we conclude that the present crop is not more than 20 per cent. over that of 1874. If we continue to have rain and such general unfavorable weather as now, we shall not gather more than last year. Prices low, and the country will experience continued "hard times."

WINTER-WHEAT.

The acreage in winter-wheat is about equal to that of the previous crop in the New England and Middle States, where the condition is full average on the whole. A small fly, description not given, injured the crop somewhat in Warren, New Jersey. Several counties in Pennsylvania report early-sown crops superior in condition to those later sown. In the South Atlantic coast States a small decrease in area sown, in Maryland and Virginia, is fully compensated by the increased acreage of the other States of this region, especially of South Carolina, which has enlarged her area 11 per cent. The condition of the crop on the first of December was full average, or above, in all the States except Virginia, which discounts her expectations 2 per cent. Some complaints of poor seed and of the ravages of the fly are here noted. The benefits of early sowing are also apparent in several counties. The use of Fultz wheat has led to a thinner seeding in some localities. The prospect is fully as good, if not better, further down the coast. The use of Navassa phosphates in fertilization is noted in Lincoln, North Carolina. In the Gulf States, the acreage has increased about 12 per cent., Texas having added 20 per cent. The condition is considerably above average in all but Texas, where it is estimated at 7 per cent. below. The seeding appears to have been late, and drought at several points has prevented the crop from coming up as rapidly as was desired. In Bosque, Texas, the seeding was delayed by grasshoppers and drought.

In all the inland Southern States there is a reduction of acreage amounting to about 5 per cent. on the whole. In West Virginia, the condition is about 4 per cent. above average, but in the other States of this region it is estimated at about the same rate of decline. Unusual pains were taken in many counties in preparing the ground, and in putting in the seed. Grasshoppers injured early-sown crops in Ohio and Hardin Counties, Kentucky. Complaints of poor seed have been received from several counties.

Of the great wheat-producing States north of the Ohio River, only Michigan equals her acreage of last year; Ohio declines 5 per cent., Indiana 13 per cent., Illinois 19 per cent., and Wisconsin 3 per cent.; the reduction of area in this region is about 10 per cent. Ohio alone reports a full average condition; Michigan and Indiana are 10 per cent., and Illinois and Wisconsin 5 per cent. below. Late seeding is noted in several counties where the crop is not very promising.

In the States west of the Mississippi, Minnesota alone has increased her very small acreage of winter-wheat. Iowa has reduced hers very materially, as, also, have Missouri and Kansas. In Minnesota and Iowa the condition is full average, but in Missouri the outlook is quite discouraging in a large number of counties. The drought and lack of snow indicate a severe exposure of the grain to winter-freezing. Lincoln County reports the presence of the fly, while in Jefferson, a small red grasshopper eats the plants as fast as they come up. Drought injures the crop in several counties of Kansas and Nebraska, but other counties report a very fine prospect. On the Pacific coast, California reduces their acreage, and Oregon quite heavily. In California the condition is below average, though the rains have fallen very copiously and earlier than usual. In Oregon the season, up to December 1, was very favorable. The following notes, from our December correspondence, will illustrate the prospects of the coming crop:

NEW JERSEY.—*Warren*: A small fly has injured the crop.

PENNSYLVANIA.—*Sullivan*: Looking badly. *Indiana*: Early sown looks promising, late not so good; planting delayed. *Union*: Wheat looks well. *Montour*: Looks well.

Tioga: Wheat late sown, and not very promising. *Lycoming*: Looks fine. *Clearfield*: Looks poor.

MARYLAND.—*Baltimore*: Wheat looks well; fine autumnal weather. *Howard*: Increased acreage, especially of Fultz. *Montgomery*: The large tobacco-crop absorbed so much attention that winter-grain was comparatively neglected.

VIRGINIA.—*Spottsylvania*: Fall favorable, and growing wheat looks stronger than usual. *Caroline*: Weather too cold. *Dinwiddie*: Since the Fultz wheat came, thin seeding has become more general; crop seeded late, but in average condition. *Gloucester*: Increased acreage; season good. *Middlesex*: Seeded late and looks inferior. *Pulaski*: Much poor seed and late sown, but crop improved by late rains. *Carroll*: Looking fine. *Augusta*: Good stand of wheat. *Halifax*: Sown early and looks well. *Washington*: Some signs of fly in early sown.

NORTH CAROLINA.—*Lincoln*: Sowing late; increased use of Navassa phosphate. *Mecklenburgh*: Late sown. *Yancey*: Does not look so well as usual. *Davidson*: Finest seeding season for years. *Nash*: Largest acreage of wheat—1,500—ever known; 800 acres of rye. *Transylvania*: Increased wheat-acreage. *Hertford*: Increased acreage. *Wilson*: Increased acreage.

SOUTH CAROLINA.—Looks well.

GEORGIA.—*Forsyth*: Wheat sown late. *Troup*: More wheat and oats sown than since 1865. *Carroll*: General disposition to sow largely of small grain. *Wilcox*: Increased acreage in oats. *Dawson*: Wheat looks well; good sowing season. *Hall*: Wheat-acreage increased 10 per cent. *Barton*: Fine fall for seeding. *Madison*: Seeding delayed by rains.

ALABAMA.—*Crenshaw*: Increased acreage in wheat, rye, and oats. *Calhoun*: Seeding late.

MISSISSIPPI.—*Winston*: Crops not half up.

TEXAS.—*Coryell*: Wheat in larger acreage than ever before. *Bowie*: Department seeds doing finely. *Dallas*: Increased wheat-acreage, but condition injured by drought. *Titus*: Drought since September; increased acreage, but ground too dry to sprout it. *Collin*: Wheat backward; drought. *Williamson*: Wheat-acreage more than double; looks well. *McLennan*: Wheat-acreage nearly doubled. *Lamar*: Too dry. *Bosque*: Seeding thirty days late; grasshoppers and drought. *Gillespie*: Increased wheat-acreage. *San Saba*: Sowing late on account of drought.

ARKANSAS.—*Baxter*: Seeding delayed by drought. *Independence*: Depressed condition on account of late sowing. *Fulton*: Injured by long drought. *Montgomery*: Late sown. *Calhoun*: Wheat-acreage tripled. *Boone*: Late seeding.

TENNESSEE.—*Fentress*: Unusual pains in preparing ground and seeding wheat; increased use of drills; acreage increased 20 per cent. *Blount*: Late seeding. *Lincoln*: late sown. *Putnam*: Wheat unusually fine. *Bledsoe*: Looks very well. *Gibson*: Rains have delayed seeding and cut down the acreage.

WEST VIRGINIA.—*Jefferson*: Wheat-acreage reduced 10 per cent.; that of rye increased 40 per cent.; wheat-acreage about 25,500 acres. *Mercer*: Acreage reduced by drought. *Taylor*: Looks well. *Raleigh*: Looks well. *Upshur*: Late sown but thrifty.

KENTUCKY.—*Nicholas*: Wheat late sown, but looks well for the time. *Boyle*: Acreage gradually decreasing, owing to scarcity and inefficiency of labor. *Graves*: Late sown and poor; Hessian fly and grasshoppers complained of. *Lincoln*: Wheat well got in and secured. *Logan*: Very imperfect seed causes great anxiety as to the next wheat-crop. *Ohio*: Acreage small on account of drought and fear of grasshoppers; the insects damaged early-sown crops so as to require the fields in some cases to be re-sown. *Owsley*: Good seed scarce. *Butler*: Wheat has come up badly; in some fields not 1 grain in 50 has sprouted. *Hardin*: Looks badly; injured by grasshoppers.

OHIO.—*Coshocton*: Wheat looks remarkably well. *Morrow*: Looks remarkably well. *Noble*: Too wet. *Tuscarawas*: Looks remarkably well. *Adams*: Late sown and reduced in acreage; thin on the ground. *Crawford*: Looks well. *Montgomery*: Fine growing weather. *Morgan*: Great reduction of acreage. *Hocking*: Looks well. *Wood*: Very promising.

MICHIGAN.—*Wexford*: Remarkably poor. *Ottawa*: Stands very evenly.

INDIANA.—*Clark*: Wheat looks well. *Grant*: Looks well. *Carroll*: The poorest growth for years. *Steuben*: Looks bad. *Warren*: Looks fine. *Harrison*: Unfavorable sowing season; early-sown fields injured by the Hessian fly.

ILLINOIS.—*Madison*: Backward and feeble; poor prospect. *Edwards*: Small and puny. *Pope*: Late sown. *Fayette*: Poor. *Schuyler*: Low condition. *Pike*: Looks very poor.

WISCONSIN.—Unusually small. *Crawford*: Late sown, but looks well.

IOWA.—*Guthrie*: Will have a hard time with the dry winter-freezing; no snow yet.

MISSOURI.—*Gasconade*: Very poor prospect. *Jefferson*: Very unpromising; eaten by a small red grasshopper as fast as it sprouts. *Franklin*: Very backward. *Crawford*: Wheat-acreage small. *DeKalb*: Wheat looks well, but the ground is too dry to protect the roots. *Carroll*: Small acreage and not doing well. *Moniteau*: Small acre-

age. *Ballinger* : Drought. *Darvess* : Unpromising. *Lincoln* : Some damage from the fly. *Shelby* : Acreage reduced one-half by drought. *Pemiscot* : But little sown on account of floods. *Reynolds* : Little sown. *Cole* : Outlook bad.

KANSAS.—*Pawnee* : Drought. *Saline* : Unfavorable. *Franklin* : Very low. *Doniphan* : Splendid condition. *Douglas* : Too dry. *Labette* : Very promising. *Lincoln* : Never so poor. *Reno* : Dry. *Leavenworth* : Too dry. *Miami* : Small acreage. *Montgomery* : Looks well ; 34,000 acres.

NEBRASKA.—*Cass* : Drought.

CALIFORNIA.—*San Joaquin* : Looks well. *Kern* : Season very favorable. *Sonoma* : Our summer fallow wheat is 3 or 4 inches high ; ground saturated and weather warm. *Tuolumne* : More rain than ever before known in November. *Contra Costa* : Copious rains will render every spot available for seeding grain. *San Luis Obispo* : Warm and very wet. *Amador* : Early-sown grain already up and looking finely. *Lake* : Grain but little sown as yet. *Placer* : Rains have put the ground in fine condition for grain. *Plumas* : Unusually dry. *Tulare* : Best prospect for six years.

OREGON.—*Linn* : Unprecedented rain-fall ; little seeding done. *Benton* : Rain-fall copious. *Clackamas* : Fine growing season for winter-wheat. *Clatsop* : Favorable to winter-grain.

Table showing the average yield per acre and price of the principal crops of the United States in December, 1875, and the area and condition of winter grain.

States.	CORN.		WHEAT.		RYE.	OATS.	BARLEY.	BUCKWHEAT.	POTATOES, (<i>Solanum tuberosum</i> .)	
	Average yield per acre in 1875, els.	Average price per bushel, Dec-ember 1, 1875, \$	Average yield per acre in 1875, els.	Average price per bushel, Dec-ember 1, 1875, \$	Average yield per acre in 1875, els.	Average price per bushel, Dec-ember 1, 1875, \$	Average yield per acre in 1875, els.	Average price per bushel, Dec-ember 1, 1875, \$	Average yield per acre in 1875, els.	
Maine	30.5	\$0 96	13	\$1 61	16.1	\$3 18	27	\$0 56	107	\$0 42
New Hampshire	38	94	17.4	1 64	18.5	1 11	35.6	57	133	42
Vermont	37	94	18	1 50	20	1 01	39	50	155	33
Massachusetts	37	95	16	1 37	17.5	1 07	29.4	61	160	52
Rhode Island	27.5	1 10	15	1 20	15	1 20	30	60	130	50
Connecticut	28	1 00	15	1 33	15	1 12	28	61	105	56
New York	32	74	8	1 31	12	86	34	44	128	36
New Jersey	65		12	1 36	12.7	80	35	48	17	67
Pennsylvania	41	58	12	1 29	13.4	85	30	41	77	105
Delaware	26	57	13.5	1 40	13.5	95	41	43	96	43
Maryland	36	55	11	1 27	12.3	77	20	44	75	72
Virginia	22	54	8	1 21	9	78	15	49	67	54
North Carolina	14	60	7.5	1 24	9	87	13	58	82	32
South Carolina	9	86	7	1 25	6.5	1 37	12.5	26	90	67
Georgia	10	86	7.5	1 50	6.7	1 49	11	29	68	1 01
Florida	10	1 08		1 50	10.5	1 87	13	1 05	110	1 20
Alabama	12.6	75	8	1 93	10.5	1 52	14	84	50	1 32
Mississippi	18	72	11	1 51	11.8	1 42	20	80	75	97
Louisiana	15.5	89	6	2 33	5.7	2 00	14		75	1 10
Texas	20	83	18	1 27	14.1	1 10	32	1 10	100	1 22
Arkansas	30	52	12.3	1 05	13.7	1 03	29.5	58	101	79
Tennessee	30.5	41	8.5	1 01	9.4	1 01	45	19	70	56
West Virginia	29.1	56	6.7	1 38	11	93	18	45	116	51
Kentucky	33.3	41	10	1 05	12.4	91	21	42	82	49
Ohio	33.2	61	9.5	1 09	11	86	46		98	36
Michigan	33	61	13.5	1 15	14.1	86	36	15.9	103	38
Indiana	34.5	39	9	97	12	75	33	18.7	125	31
Illinois	34.5	34	10.5	91	16.5	88	19	69	114	36
Wisconsin	21	54	14	91	17.5	61	33	15	130	33
Minnesota	29.4	42	17	86	19.5	33.5	28	13.5	105	93
Iowa	25	27	9.7	71	18.1	32	35.7	16.7	137	29
Missouri	36.5	23	9	95	13.4	33.7	19	77	121	24
Kansas	38.5	23	12.5	87	16	31.6	24	17.4	110	37
Nebraska	38.5	20	9.8	51	16.5	21.2	25	17.8	112	27
California	36.8	1 07	11	1 18	17.5	52	33	21.5	175	19
Oregon	27.6	91	17.6	1 87	19.5	95	35	18.4	130	76

Table showing the estimated numbers of farm-stock, expressed as a percentage of the numbers of the previous year, and also an average of actual prices in January, 1876.

States.	HORSES.						MULES.				MILCH-COWS.	
	Total number of horses compared with that of January, 1875.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price per head over 3 years old.	Total number of mules compared with that of January, 1875.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price per head over 3 years old.	Total number of milch-cows compared with that of January, 1875.	Average price per head at this time.
Maine.....	101	\$29 50	\$47 40	\$72 64	\$3 46	100	\$41 00	\$64 50	\$98 00	\$114 37	98	\$37 00
New Hampshire.....	101	29 62	49 67	71 75	107 50	100	42 00	75 00	102 00	130 00	102	37 50
Vermont.....	103	29 70	48 95	74 80	106 30	103	38 50	60 38	87 75	115 00	103	38 50
Massachusetts.....	99	30 00	48 33	72 66	108 33	100	45 00	57 50	72 50	105 00	104	33 70
Rhode Island.....	100	30 50	50 00	82 50	110 50	100	34 32	52 50	78 75	98 00	101	48 33
Connecticut.....	101	30 00	49 75	80 00	108 33	100	41 00	64 50	98 00	120 00	100	39 00
New York.....	102	35 00	57 50	86 29	111 58	100	42 00	75 00	102 00	130 00	98	43 33
New Jersey.....	100	44 37	75 62	102 50	126 25	100	38 50	60 38	87 75	115 00	102	37 50
Pennsylvania.....	102	34 88	54 72	80 45	108 33	103	40 00	57 50	72 50	105 00	98	41 37
Delaware.....	98	35 50	50 00	70 00	95 00	100	45 00	57 50	72 50	105 00	101	34 68
Maryland.....	101	33 44	54 75	80 00	108 50	102	45 00	72 14	100 00	120 00	101	32 00
Virginia.....	102	27 61	43 06	64 27	86 35	100	34 32	52 50	78 75	98 00	101	30 31
North Carolina.....	105	31 31	48 16	67 92	90 00	105	31 43	57 14	80 14	99 00	102	15 48
South Carolina.....	99	32 85	50 00	74 60	100 00	97	31 34	50 69	79 11	99 00	100	19 75
Georgia.....	101	33 00	47 50	70 50	98 00	105	40 00	63 33	95 00	113 33	103	17 02
Florida.....	100	32 64	51 98	67 16	85 27	99	37 26	54 37	77 18	95 41	99	20 27
Alabama.....	101	97 41	42 79	62 35	89 00	100	32 00	50 50	74 50	102 70	97	21 03
Mississippi.....	102	17 00	36 67	43 50	85 00	100	30 00	50 00	78 00	104 00	103	20 71
Louisiana.....	107	13 04	19 32	28 28	45 50	103	29 81	32 63	49 16	67 99	95	15 72
Texas.....	106	19 79	29 64	43 94	68 80	106	25 83	38 58	58 66	83 00	106	16 20
Arkansas.....	100	30 00	45 00	62 45	82 50	95	30 90	49 02	72 50	93 00	93	50 83
Tennessee.....	105	26 56	41 02	57 97	78 55	100	32 00	47 65	72 50	93 00	101	55 77
West Virginia.....	104	26 25	39 60	55 30	75 00	96	29 24	46 70	68 50	84 72	99	27 94
Kentucky.....	101	29 31	46 92	65 37	92 00	99	33 00	50 00	71 00	95 15	104	32 65
Ohio.....	103	38 12	53 52	76 69	98 00	103	34 20	53 80	78 18	109 00	104	33 70
Michigan.....	102	26 11	40 52	58 49	80 32	99	30 15	45 38	67 60	94 50	99	29 40
Indiana.....	103	24 63	37 73	56 15	78 45	100	33 67	52 71	74 62	105 00	107	26 75
Illinois.....	101	26 55	43 92	62 96	90 12	103	33 67	52 71	74 62	105 00	107	26 75
Wisconsin.....	107	30 50	48 00	59 52	84 88	103	33 73	48 47	71 21	101 50	105	26 90
Minnesota.....	106	26 73	40 60	59 52	84 88	103	33 73	48 47	71 21	101 50	105	26 90
Iowa.....	102	29 76	30 56	43 09	59 95	104	28 09	39 51	58 25	77 68	99	30 86
Missouri.....	105	20 85	31 19	45 85	66 42	106	28 09	39 51	58 25	77 68	99	30 86
Kansas.....	114	24 32	41 00	63 00	83 45	107	33 18	55 00	77 31	107 63	111	23 76
Nebraska.....	91	16 88	26 00	37 00	62 25	94	23 00	34 33	55 00	93 50	107	31 46
California.....	107	19 00	27 50	39 28	60 43	101	18 50	25 40	36 00	62 00	106	21 75
Oregon.....	107	19 00	27 50	39 28	60 43	101	18 50	25 40	36 00	62 00	106	21 75

Table showing the estimated numbers and prices of farm-stock in January, 1876—Continued.

States.	OXEN AND OTHER CATTLE, (NOT INCLUDING MILCH-COWS.)					SHEET.			HOGS.		
	Total number of oxen and other cattle compared with that of Jan. 1875.	Average price per head under 1 year old.	Average price between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price 3 years old.	Total number of sheep compared with that of Jan. 1875.	Average price per head under 1 year old.	Average price per head over 1 year old.	Total number of hogs compared with that of Jan. 1875.	Average price per head under 1 year old.	Average price per head over 1 year old.
Maine.....	100	\$10 89	\$20 43	\$13 19	\$75 22	107	\$3 00	\$4 03	95	\$9 53	\$23 75
New Hampshire.....	101	11 12	21 37	31 50	59 37	100	2 40	3 87	101	11 25	27 25
Vermont.....	100	9 00	16 40	28 50	56 80	95	3 15	3 97	99	9 80	23 50
Massachusetts.....	99	14 00	22 33	33 33	65 33	100	3 00	3 75	100	12 50	26 33
Rhode Island.....	100	13 50	22 00	38 50	57 50	100	3 55	4 00	99	13 00	26 50
Connecticut.....	99	12 16	18 75	32 00	56 00	105	3 70	4 30	96	12 16	25 25
New York.....	99	10 31	19 40	32 08	51 96	97	3 15	4 25	97	8 39	18 10
New Jersey.....	99	12 12	21 25	35 00	47 25	99	4 75	5 08	93	11 12	20 50
Pennsylvania.....	98	10 65	19 28	31 35	45 95	98	2 80	3 95	94	8 01	18 00
Delaware.....	100	8 50	12 75	20 00	32 00	102	3 00	3 75	97	7 30	16 50
Maryland.....	103	9 25	14 66	24 64	36 32	102	3 16	4 21	94	5 34	10 27
Virginia.....	100	6 22	10 72	17 57	25 00	97	2 40	3 15	89	3 25	7 14
North Carolina.....	101	3 55	6 33	10 21	15 35	103	1 29	1 73	94	2 56	6 22
South Carolina.....	100	5 50	8 75	13 80	18 00	97	1 42	1 97	91	3 25	7 00
Georgia.....	102	3 97	5 97	9 29	13 47	99	1 27	1 94	101	2 27	5 27
Florida.....	103	4 00	5 87	8 50	11 56	120	1 40	2 08	92	1 17	4 06
Alabama.....	99	5 44	8 12	12 40	18 71	102	1 48	2 11	83	2 03	6 07
Mississippi.....	97	4 25	7 11	11 19	17 22	103	1 44	2 02	103	2 95	6 47
Louisiana.....	106	3 62	6 86	10 50	17 25	99	1 50	2 32	106	2 50	6 14
Texas.....	93	3 54	5 87	9 13	14 18	117	1 38	2 20	95	2 32	5 86
Arkansas.....	105	3 80	6 72	10 25	16 00	105	1 40	2 30	102	2 40	6 10
Tennessee.....	95	4 75	8 57	13 22	20 64	100	2 50	2 40	86	3 57	8 77
West Virginia.....	99	8 65	15 61	25 00	36 20	101	2 06	2 83	80	3 75	8 71
Kentucky.....	99	8 22	14 72	23 32	36 05	90	2 29	3 06	84	3 89	10 19
Ohio.....	97	9 40	17 66	28 36	41 55	99	1 95	3 09	92	5 63	13 50
Michigan.....	101	7 90	15 48	26 94	43 00	101	2 00	2 94	100	5 80	13 18
Indiana.....	98	7 19	13 68	21 84	33 62	89	1 89	3 00	80	5 14	13 33
Illinois.....	99	7 50	14 00	24 24	35 74	95	1 75	2 75	87	5 76	13 75
Wisconsin.....	103	7 00	12 48	19 52	33 00	96	2 00	3 13	92	5 64	13 41
Minnesota.....	108	7 21	12 80	20 14	33 80	108	1 90	3 00	104	5 68	11 28
Iowa.....	105	8 45	14 61	23 78	35 72	98	1 95	3 00	97	5 78	13 75
Missouri.....	100	6 41	11 56	18 59	28 81	94	1 46	2 09	88	4 14	9 80
Kansas.....	102	6 98	13 04	20 72	30 28	126	2 10	3 15	106	5 82	14 92
Nebraska.....	110	7 00	13 17	21 24	32 51	123	1 91	3 00	97	4 65	13 57
California.....	97	7 14	12 71	20 00	29 00	105	1 56	2 22	90	4 92	10 55
Oregon.....	109	5 75	8 14	13 07	19 28	112	1 66	2 18	104	3 10	6 03

EXTRACTS FROM CORRESPONDENCE.

STYLE OF FARMING IN NEW ENGLAND.—*Vermont.*—*Orleans*: Within one mile of my house are kept, by ten farmers, 150 cows, 20 horses, 1 yoke of oxen, 1 pair of yearling steers, about 25 yearling heifers, 15 calves, 20 sheep, and 20 yearling pigs. In other parts of the county the stock is largely cows, and butter is the main product. All of the hay and straw is kept in barns. The stables for cows are made quite warm, and the cows are tied in stanchions, allowing three feet to each cow. Water is usually brought under ground, in logs or lead pipes, to a trough in the yard. We estimate that an average cow requires two tons of hay to keep her through the winter. Snow came November 1, and we expect to feed until the 20th of May.

Connecticut.—*Windham*: It is the prevailing custom of our best farmers to turn off two crops of hogs in the year, the one in the spring and the other in the fall. We fatten them till they weigh 175 to 200 pounds and then sell. We invariably keep them penned up. If we do not grow corn and other feed, we buy it. By this means we make manure and increase the fertility of the land. We formerly did a great deal of work on farms with oxen, but now horses have taken their place to a great extent.

DISEASE AMONG CATTLE.—*Minnesota.*—*Martin*: Many yearling cattle have died lately. Some call the disease black-leg; others congestion of the lungs, or lung-fever. The blood seems to settle around the lungs and through the chest. Upon inquiry I cannot learn that any have died except where they have fed on wheat and oat chaff and where they have been poorly salted. They are first noticed as stupid, and die in a few hours.

Tennessee.—*Grundy*: Many cattle poisoned by seed of a pear-shaped fruit, upon a plant about two feet high. The first effect of the poison is excessive thirst, causing the animal to drink large quantities of water. It then puffs up, grows weak, lies down, and never rises again. It refuses fodder, and ceases to ruminate, dying in from one to four days. Stomach and entrails visibly "blighted."

Missouri.—*Holt*: About 150 cattle have died from too rapid feeding with soft corn.

VALUE OF POULTRY PRODUCTS.—*Pennsylvania.*—*Bucks*: One of my assistants wonders at the absence of poultry estimates in these reports. He justly remarks that if the extent of that interest were thoroughly examined into, it would be found a leading instead of a subordinate industry. Farmers through this county sell from \$50 to \$400 worth of poultry for each 100 acres of land. It is a source of much of the profit of farming. Many estimate it as second only to the dairy.

DOGS.—*Connecticut.*—*New London*: Dogs have done much mischief in killing and hurting sheep and lambs.

New York.—*Wayne*: We are nearly overrun with worthless dogs. They multiply rapidly.

New Jersey.—*Burlington*: For losses of sheep by dogs, \$2,362 have been paid out, and one township has not yet reported. One township has paid \$500, and nearly every township reports less than the actual number.

Pennsylvania.—*Wyoming*: This county is one of the best, if not the best, in the State in advantages for profitable sheep-raising. From any part droves of sheep or lambs can start in the evening and be in market the next morning, with no car-fare or middlemen to pay, and the farmers

realize for them the highest prices paid in the United States. But, owing to worthless dogs which roam through the fields and woods, killing the sheep and running them out of the pastures, we cannot make sheep-raising profitable. Out of the dog-tax, \$901.40 have been paid for destruction by dogs, the owners of which were not able to pay damages; but for chasing and worrying the sheep, and driving them from field to field, which is the worst part, there is no pay. Besides, our orchards are becoming worse and worse for the want of sheep to destroy the insects by devouring the wind-fall apples, and rubbing and stamping around the trees. Sheep are much better for orchards than hogs. *Montour*: For some twelve years I have had no sheep killed by dogs, although exposed day and night in the fields. I think it is owing to my putting eight or ten bells on a flock of forty or fifty sheep. Neighbors who do not adopt this plan have sheep killed by dogs, but I have not had one attacked since I adopted it.

Maryland.—*Baltimore*: Sheep-husbandry could be made profitable, but the business will be prostrate as long as we have more worthless dogs than sheep.

Virginia.—*Page*: Considering the capital invested, sheep would be our most profitable stock were it not for the dogs; but unless some law is passed to protect sheep, we fear they will become extinct. The persons who are the least able to feed dogs always have the most of them. *Powhatan*: We have in the county a dog-law, now in force, which has reduced the number of dogs some 20 per cent. Sheep-husbandry has taken a new impetus. Within the last two months one farmer has introduced into the county 700 sheep from West Virginia. *Highland*: Sheep would be on the increase but for the dogs. The number annually killed would rather exceed than fall short of 1,200. *Sussex*: The number of sheep will continue to grow less until there are none left, unless some means can be devised to rid the community of dogs. It is thought that there are now in Sussex ten dogs for every sheep. Our State Legislature seems to be *afraid* of the dogs. Cannot Congress do something to help us? With the abatement of this nuisance sheep-husbandry would soon become a leading and one of the most profitable branches of industry in the county. Wool could be more cheaply raised here than cotton. *Prince William*: The dog-tax will not pay more than 10 per cent. on the loss of sheep by dogs. In Manassas Township seven farmers, on four square miles, lost, by dogs, during the fall and this winter, 165, or 60 per cent. of their whole number. *Augusta*: Since the adoption of the dog-law dogs are becoming scarce, and sheep increasing; think we will have plenty in a few years. *Rockbridge*: There has been such a falling off in sheep that they are scarcely worth reporting. Still, a great many have been killed by dogs, even among the small flocks. If a law for taxing dogs could be passed and carried out, ours would soon be a *wool-growing* county.

North Carolina.—*Hertford*: Sheep would do well, but for the multitude of dogs. As a general rule, the poorer the man, the more dogs around him; consequently, where the sheep once abounded they are rapidly disappearing. *Gaston*: Dogs have done very little damage the past four years, and sheep are fairly on the increase. *Haywood*: If the sheep destroyed by the two-legged dogs be counted, the number will go far above the estimate in the report.

Georgia.—*Walker*: Our farmers are turning attention to sheep-raising, which would be profitable if we had a good dog-law. *Macon*: Sheep are decidedly on the increase, and we are making strenuous efforts to effect the enactment of a dog-law for their greater protection. *Gwinnett*:

Great complaint of the destruction of sheep by dogs. We hope to get a dog-law when the legislature convenes. *Carroll*: If there were some law to protect sheep-raisers from dogs, the business would be increased; but so long as every man is allowed to keep from five to ten half-starved curs, it is useless to begin.

Alabama.—Cathoun: Dogs destroyed sheep so extensively in years back that the people had almost quit raising them; but within the last two years many have commenced again on a small scale, keeping the few they have in pastures near home.

Mississippi.—Lauderdale: The dogs have killed sheep to such an extent that few farmers attempt to raise them. *Noxubee*: Owing to rotten-down inclosures, many sheep are lost by dogs and thieves. *Wayne*: Many sheep are killed by dogs.

Texas.—Titus: There is a great desire among farmers to raise sheep, but many are deterred on account of the worthless dogs with which the county is infested. *Williamson*: Sheep are better cared for than formerly, and the losses by dogs are much less.

Arkansas.—Independence: A law, recently enacted, imposing a tax on dogs, will encourage sheep-raising and prevent so much dog-raising, a business in which Arkansas excels. *Howard*: Very few sheep were killed by dogs in 1875, for the reason that they had killed nearly all in the county before that. *Benton*: Our last legislature passed a dog law, and sheep-raising now has some encouragement to go ahead. *Saint Francis*: There are in the county a great many more dogs than sheep; consequently, those who keep sheep are all the time annoyed by the worthless curs. *Crawford*: I have put the number killed by dogs at 1,500, and this is low. Properly speaking, there are no sheep-raisers here now, and those who keep a few cannot gain on their number; they diminish.

Tennessee.—Gibson: Owing to the ravages of dogs, sheep-raising has been almost entirely abandoned. *Roane*: A tax on dogs has diminished the number very much. *Grainger*: Sheep are more profitable than any other stock. We are trying a dog-law with excellent results, but it is feared that demagogues will take it from us. *McMinn*: The sheep killed by dogs were, in 1875, less by two-thirds than in previous years, owing to the tax, which caused many a dog to die. *Bedford*: We have more and better sheep than ever before—the result of a dog-law. In the county, in 1875, 5,000 dogs were assessed by me, and at least 3,000 were killed to avoid assessment. *Coffee*: Our last legislature passed a dog-law, which has done a great deal of good. There is now a growing disposition to go into sheep-husbandry. Last spring over 10,000 lambs were shipped from Nashville to Louisville, Kentucky.

West Virginia.—Jefferson: The interests of sheep-owners are now protected by a dog-law, which is being enforced right well. Sheep are increasing rapidly.

Kentucky.—Calloway: In my neighborhood a great many sheep have been killed by dogs, which seem to increase faster than the sheep. Not less than three or four to a family.

Indiana.—Shelby: The loss of sheep by dogs so discourages many farmers that they are disposing of entire flocks. *Jennings*: We have nearly abandoned sheep-raising, owing to dogs.

Illinois.—Saline: The falling off in sheep is owing to the fact that they have suffered badly from dogs. *Clay*: Sheep-husbandry declines, because of their destruction by dogs. *Pope*: Doubtless the dogs destroy, annually, 7 to 10 per cent. of the whole number of sheep.

Missouri.—Lincoln: In nearly every case the fine flocks have suf-

fered from dogs. The best breeds make the best mutton, judging from the canine selection and taste.

DISEASES AMONG HOGS.—*New Jersey*.—*Burlington* : Sickness, called 'cholera, has made havoc in many yards; some have lost as many as 90; others, nearly all they had.

Pennsylvania.—*Montour* : Some fine hogs have died of cholera.

Virginia.—*Middlesex* : At least one-tenth of the hogs have been destroyed by cholera, and it has not eased up yet. *Northampton* : The supply of hogs cut short by cholera. *Halifax* : Many hogs have died of cholera, and some of measles and quinsy.

North Carolina.—*Cumberland* : Different kinds of disease, all known as cholera, have been very fatal to hogs. Some farmers have lost all. Hogs that recover lose their bristles, and are nearly worthless. *Wilkes* : Hog-cholera has prevailed in some sections. *Camden* : Hogs are dying with something like quinsy. They are taken with a cough and swelling about the throat, and in a day or two are dead. *Wilson* : Many of the hogs died last fall. *Pitt* : A decided prospect that the county would be self-sustaining as to pork was blasted by a peculiar febrile disease, killing, regardless of age or condition, at least one-third in number. It is still prevailing, and not amenable to any treatment yet suggested. *Watauga* : In portions of the county hogs are dying of cholera; some farmers have lost nearly all. *Brunswick* : Many hogs have died of cholera, and the small pigs are killed by bears, foxes, and wild cats.

Georgia.—*Coffee* : Hogs have died rapidly with cholera. *Wilcox* : Hogs died to a considerable extent in the fall with cholera. *Gilmore* : Cholera among hogs in some sections.

Florida.—*Fayette* : Hogs in certain localities are dying from an unknown cause; 50 per cent. of the pigs sicken and die. *Gadsden* : The cholera destroyed one-third of the hogs. Commenced about the first of May and ceased about the first of July.

Alabama.—*De Kalb* : Cholera has made havoc among the hogs.

Louisiana.—*Jackson* : About 1,200 hogs died of cholera.

Texas.—*Austin* : Many hogs have died. *Upshur* : Last winter, disease nearly cleaned out the hogs from this county.

Arkansas.—*Bradley* : A disease has prevailed among the hogs, called cholera, but much unlike the disease so called in former days. They are taken with vomiting, and die in from one to four days. A few get well, from which the hair generally drops. *Jefferson* : Hogs under one year died the past summer and fall to a large extent.

Kentucky.—*Edmondson* : Cholera has prevailed in a part of the county since last September. *Logan* : Owing to a very short corn-crop in 1874, and no clover in the county in 1875, at least 20 per cent. of the hogs died of starvation during the year. There are fewer hogs in the county now than for many years. *Owsley* : Hogs have died off by disease until the farmers have become discouraged from raising them, and there are not enough to half supply the county for consumption. *Graves* : Hog-cholera has prevailed to some extent; about 10 per cent. have died. *Ohio* : The falling off in the number of hogs is owing to cholera.

Ohio.—*Pickaway* : The cholera has taken off quite a number of our hogs. *Licking* : Have lost some hogs by cholera.

Indiana.—*Gibson* : Since the cholera ceased hogs are doing well. *Decatur* : Cholera has prevailed to an alarming extent among the hogs, and greatly reduced the number of pigs. *Shelby* : Decrease in the percentage of hogs is caused by the ravages of cholera. *Warren* : Hog-cholera has prevailed in two townships. *Jennings* : Probably one-fourth of all the hogs have died of cholera. *Hamilton* : Hog-cholera visited our

county the past season, and was very fatal. It is now somewhat abated. *Washington*: About 10 per cent. of the hogs have died of cholera. *Clay*: The number of hogs has been steadily declining for three or four years, owing to the prevalence of cholera. *Brown*: Many hogs have died of cholera in portions of the county.

Illinois.—*Saline*: Cholera among the hogs has prevailed throughout the county to an alarming extent. *Tazewell*: Hog-cholera has prevailed to some extent; mostly confined to young hogs; very few fattening hogs have died. *Fulton*: The fatality, by cholera, among the pigs of last spring has been unusually large. *Scott*: Cholera has killed nearly all the hogs in the county. *Knox*: Hog-cholera very bad, and also a new disease in the form of colds, coughs, and lung difficulties.

Iowa.—*Iolk*: Fully 25 per cent. of our hogs have died of the cholera, so called. *Harrison*: Many hogs dying of what is called cholera.

Missouri.—*Carroll*: The hog-cholera has been all the fall, and is now, very destructive, and there appears to be neither preventive nor remedy. *Nodaway*: Cholera, so called, which is nothing more than worms, has destroyed 20 per cent. of our hogs. They might have been saved by feeding, constantly, copperas and sulphur, alternately, at the rate of a table-spoonful to 8 hogs, every fourth day. This is a preventive. There is probably no cure. *Macon*: A great many hogs have died, and a great many are still dying, of some disease.

AGRICULTURAL PROSPECTS.—*New Hampshire*.—*Cheshire*: Hundreds of acres are worked over every year without manure, giving but small crops. This reduces the average of our highly-cultivated fields. *Carroll*: The farmer goes into winter-quarters with contentment, in spite of high taxes and scarce money, as the barns are well filled and stock in good condition.

Vermont.—*Essex*: November, a hard month, requiring liberal feeding.

Maryland.—*Harford*: Very few cattle fed; pasture still good.

Virginia.—*Henrico*: Our farmers do a vast deal of labor for nothing; they cultivate too much land in cereals and too little in forage-crops. A ton of hay is a small average here, yet it is worth more than 30 bushels of corn, with much less labor to make it. *Appomattox*: Freedmen generally imperfect cultivators when left to themselves; they are poorly furnished with implements, and are growing poorer.

North Carolina.—*Wayne*: At the close of the year farmers feel disposed to allot less land for cotton, but when planting comes their resolves are forgotten. Land prepared with the same care for wheat as for cotton would yield over twenty bushels, besides a subsequent crop of turnips or pease, greatly improving the land and reducing the cost of labor. We need to get out of the ruts. *Nash*: More than usual of acres in winter-oats; more stock-hogs, sheep, and cattle; more economy in expense; more thorough manuring and more diversity of crops; more labor by the farmers and less hiring. *Camden*: Crops mostly average, but low prices discourage the farmer. *Beaufort*: Improved farms increasing.

South Carolina.—*Clarendon*: Much suffering must result from want of provisions. *Union*: Fine fall for harvesting. *Chesterfield*: Hard times the coming year.

Georgia.—*Harris*: Crops short, cotton low, and people in debt; condition worse than since the war. *Troup*: Great change for the better in farming.

Alabama.—*Saint Clair*: Better farming and better tools. *Henry*: People disposed to greater economy.

Louisiana.—Lafayette: Average yield of all crops low on account of bad cultivation.

Texas.—Washington: Everybody swears to go slow on the cotton question, but everybody plants largely and neglects other crops.

Tennessee.—Monroe: Fine breeds of cattle, sheep, and hogs being introduced, with better seeds and implements.

Kentucky.—Boyle: Scarcity and unreliability of labor causes a change from grain to grass. The fault lies in not stirring the ground to a sufficient depth; this is chargeable as much to the employer as to the laborer. *Pendleton:* Farm-products are not paying farmers much except hogs, which sell at \$6.75 to \$7 per cental gross at the pen.

Ohio.—Coshoccon: Farmers generally in good spirits, being liberally rewarded by ruling prices and average yields, and having sustained no losses of stock during the year. *Belmont:* The past year has been the least prosperous for ten years; fruit a failure, wheat and hay half crops, and wool low.

Indiana.—Gibson: Plenty to eat, but money scarce.

California.—Sonoma: The coming season very promising.

CHUFA, OR EARTH ALMOND.

The Department has of late received many inquiries for seeds of the chufa, (*Cyperus esculenta*), as well as requests for information as to its character and cultivation in this country. To meet these inquiries, the Department has ordered from France a supply of the seed for distribution.

The chufa is a perennial, indigenous in the south of Europe, growing in the form of a rush to the height of about 3 feet, producing small tubers about the size of an ordinary bean, called by the French *souchet comestible*, (rush-nut.) It was introduced into this country more than twenty years ago, and proved very prolific when planted in the light sandy soils of the Middle and Southern States, as also in richer soils.

It belongs to the same genus as the notorious wild "nut-grass," (*Cyperus repens*), but does not spread like that pest of southern fields.

In taste, the tubers resemble a delicious chestnut or cocoanut, and, like them, may be eaten raw or cooked. After soaking in water twelve hours, they may be eaten as a sauce. Dr. C. T. Jackson, of Boston, Mass., analyzed them, and furnished the following result for the Agricultural Report of the Patent Office, 1857, page 166:

Water.....	15.50	per cent.
Fibrous matter.....	21.45	" "
Starch.....	27.00	" "
A peculiar sugar, like manna.....	12.25	" "
Wax.....	0.50	" "
Fat oil.....	16.65	" "
Mucilage, or gum, with a little albumen.....	6.65	" "
	100.00	

Doctor Jackson further stated: "When these tubers are beaten to a paste and mixed with water a remarkable emulsion is formed, which, after straining, resembles milk in appearance. The fat at length rises to the surface and looks like cream, while most of the starch subsides to the bottom of the vessel; but enough still remains suspended to give the emulsion the appearance of thin or skim milk. Thus mingled with water, the most nutritive ingredients of this plant may be taken as a drink. It is much used in this manner by the Spaniards, and I have no doubt will be so employed in this country. This emulsion may be sweetened and flavored, so as to make it very agreeable to the taste."

A writer in the Agricultural Report of the Patent-Office for 1855, p. 259, wrote that he had raised a patch of them at Pittsburgh, Pa., each plant of which had produced over 100 tubers; and that when pounded with sugar the mixture is equal in every respect to the emulsion of almonds. They are chiefly used in Spain and other hot European climates, for making an orgeat, (*orchata de chufas*), a delightful and refreshing drink.

Mr. A. Peabody stated, in the "Southern Plantation," that, some twenty years previously, he had received five tubers from the Patent-Office, and had raised them ever since, a single nut producing a quart of tubers in ordinary soil. On land that will produce 20 bushels of corn, 100 bushels of chufas can easily be raised—the chufas being double the value of corn, as they require neither digging nor storing, and do not rot in the ground, being uninjured by cold or frost. Hogs will dig them as they want them, and fowls will soon learn to scratch them out of the ground, they growing sufficiently near the surface. He also says that poultry fattened on them excel in delicacy of flavor the celery-fed canvas-back duck.

According to Mr. Peabody, the chufa delights in a light sandy soil, and may be planted at any time (in the South) from December to April. He planted them in shallow furrows, two feet apart; single tubers one foot apart in the furrows, and "covered with a board"—(probably during winter.) They vegetated the first warm weather, and when weeds appeared, required only "a sweep" to be run between the rows. The green spikes soon multiplied, and eventually met across the rows, each spire having a nut at the bottom. He found the roasted chufa superior to chocolate as a breakfast beverage.

Mr. Peabody concludes his article thus: "When we take into consideration all its good qualities—its fattening properties, its easy culture, its hardiness, and the fact that hogs will dig them as they want them without wasting them—we wonder that they are not more extensively raised by our farmers. It is the most valuable seed the Patent-Office ever sent out, and is destined to prove a great boon to the South."

Another writer recommends that in the Middle States the chufa be planted in June or July, in hills two feet apart each way, ten or twelve tubers to each hill, and the tubers placed four to six inches apart. When the first shoots appear, if there is no rain the ground should be watered. No cultivation is needed except to keep them clear of weeds. They blossom in September, and the flowers may be pinched off to increase the size of the tubers, which mature about October, when they may be dug and stored.

The chufa is not only a fattening food for swine and fowls, as it is much relished by them; but an excellent oil may be expressed from it, after which the cake will still be valuable for feeding animals, and will increase the quantity and richness of the milk of cows, if fed to them.

CHEMICAL MEMORANDA.

BY WILLIAM MCMURTRIE, CHEMIST.

AMERICAN OPIUM.—The cultivation of poppy in this country for the production of opium does not seem to have received the attention it deserves. The efforts of this Department to arouse an interest in this particular by distribution of seeds of the best varieties to its more progressive correspondents, have, however, been occasionally rewarded with reports of experiments of an encouraging character, and we take pleasure in publishing the following notes of an experiment furnished by Mr. Charles Patton, Germantown, Tenn.

I take great pleasure in reporting the result of my experiment in making opium from the seeds of white poppy received early this spring from the Agricultural Department; and to substantiate in part my report, I have forwarded to the Department, by mail, a package containing the principal part of the opium produced, which you will please dispose of as suits your pleasure.

Having no other guide upon the subject than the communication in the Agricultural Report for 1870, one-tenth of an acre was measured off to receive the seeds. The plot had been cropped with turnips the previous fall, manured with sheep-droppings. On the 15th of April the ground was plowed, harrowed, and dragged very fine, and the seed drilled in rows, 18 inches apart. May 3 the hand-cultivator was run between the rows and the plants thinned to a stand, 6 to 9 inches between plants. The cultivator was run once more, on the 24th of May, and this was all the cultivation required. On the 15th of June the plants commenced blooming, and two days thereafter the first opium was gathered. The implement used for scarifying was the blade of my pen-knife. One or two horizontal incisions around the capsule were in most cases sufficient to extract the opium. I find a greater loss of juice by the up and down incision than from the horizontal. An instrument making two or three cuts horizontally at one operation would prevent all loss, as each would be able to sustain the weight of the liquid until hardened by exposure. By the present mode of extracting, I think not less than ten to twelve per cent. of the opium is lost. The plants ceased blooming about the first of July, and on the 4th the crop was finished, making eighty-one days from the time of planting.

The sample sent by Mr. Patton was reserved for exhibition and analysis. It was of fine homogeneous texture when dry, of dark brown color, was perfectly free from seeds, stems, or other extraneous matters, and weighed nearly five ounces.

The portion of the sample taken for analysis was found to contain:

	Per cent
Moisture	15.24
Morphine	7.10

Comparing this result with those obtained from analyses of other varieties of American opium, or even of foreign products, proves it to be of fair quality, and from its appearance it is better than the average opium found in the markets.

It is about equal to good Egyptian and East Indian products.*

"POISONED" SOILS OF TEXAS.—During the summer of 1872 the Department had occasion to investigate the cause of a property peculiar to certain soils of Texas and some of the neighboring States, and, without personal examination, from chemical analysis of a sample sent us, concluded it was due to a deficiency in under-drainage, a conclusion since supported by a letter from Mr. A. J. Graves, of that State.

Our attention was again called to this matter by Hon. R. Q. Mills, of the fourth congressional district, who communicated a letter from Mr. W. T. M. Dickson, of which the following is an extract:

About two years ago last month I forwarded to the Department of Agriculture, under instructions from the Commissioner of Agriculture, four packages of black

(*Compare report of this Department for 1873, p. 174.)

soil, carefully labeled, wrapped, and mailed, for analysis. The object of the analysis, as explained in the accompanying letter, was to ascertain the cause and remedy of that peculiar property in our soils which is fatal to cotton and most garden-vegetables, to *bois-d'arc* and all our cultivated trees except the peach and most of the native trees. The cereals, however, wheat, corn, oats, barley, rye, &c., appear to be injured, but not destroyed by it.

It will be seen that these conditions are precisely similar to those described in the report referred to in the following communication addressed to Mr. Mills by the Commissioner.

DEPARTMENT OF AGRICULTURE,
Washington, December 14, 1875.

SIR: Your note of the 13th instant, inclosing letter from Mr. Dickson, is at hand.

The difficulty existing in the soils of Texas, referred to by your correspondent, was fully discussed in the Annual Report of this Department for 1872, and the deductions there made have been fully corroborated by Mr. A. G. Graves, jr., of McKinney, Collins County, Texas. The position taken in the article in question, without personal examination of the locality, was, that the difficulty was due to a deficiency in underdrainage; that the water of the subsoil was held in place, thus precluding the admission of oxygen to the soil, and preventing the decomposition of the organic matter holding the mineral elements of plant-food in insoluble combinations, not capable of being absorbed and assimilated by the plants in growth. This will explain why cereals and other plants supplied with superficial roots are uninjured, they being able to derive their nourishment from the surface-soil. But after plants having long tap-roots have reached that stage of development in which their roots penetrate the subsoil where this unfavorable condition exists, the subsoil, saturated to its fullest extent with stagnant water, is unable to give up the nutriment it contains, an unhealthy condition for the plants exists, and they naturally die from starvation and bad treatment.

Mr. Graves found, in preparing to set a fence through a piece of ground where, from the cause in question, a hedge of osage-orange, or *bois-d'arc*, had become diseased and had died, that when holes were made to enter the subsoil of that portion where the destruction had been greatest and most marked, water rose in them, filling them to the same level. The description of his experience as detailed in his letter is as follows:

"I had occasion to run a line of fence across one of these spots where an osage-orange hedge had died out, a distance of about 50 yards. In boring post-holes for fence to close this gap, it was necessary to bore one at each end, just outside of the spot. The grade of the land was an inclination of about one foot in thirty. It being rather wet, water rose in the holes very quickly along through the spot, decreasing in depth somewhat near the ends, while in the holes just outside the spot it scarcely ran in at all."

This proves that where such a condition exists, the line of division between the surface-soil and subsoil is undulating, and the subsoil being of close texture, and impenetrable to water, underground ponds, if the term be allowable, are formed. When the roots of plants reach the level of the water and pass beneath it, destruction takes place.

Application of lime, as recommended in the article referred to, will doubtless have a good effect as a remedy for this difficulty, but the best way of removing it effectually will probably be found in underdrainage. From information we have received, this may be somewhat difficult in some localities, and may, in some cases, be impracticable. It has been suggested that, since below this hard stratum of subsoil may be found a stratum of loose sand or gravel, it will be possible to remove the water from these spots by piercing holes through the hard subsoil to the loose stratum below, and making such openings about the center of each spot. Whether this will be practicable, can be determined only by experiment. It will, however, be worth a trial. Should your correspondent undertake such experiment, it would afford us great pleasure to be advised of the result. If successful, it will be of great value to all planters in the vicinity of the mouth of the Mississippi.

Our failure to examine the samples of soils when received was due to the fact that they were unaccompanied with a letter of instructions with regard to the locality from which they were taken, and the existing conditions. This is always indispensable in such investigations.

Very respectfully,

FREDERICK WATTS,
Commissioner of Agriculture.

Hon. R. Q. MILLS,
House of Representatives.

FIXATION OF ATMOSPHERIC NITROGEN IN THE SOIL.—In some of the late numbers of "*Comptes Rendus de l'Academie des Sciences*," Mons.

P. Truchot has published a series of papers upon the chemical properties of soils, and in the first paper he seeks to show from the results of analyses of a number of soils that the amount of nitrogen appropriated by the soil from the atmosphere bears a direct relation to the amount of carbon present in the ulmic compounds it contains. That nitrogen is taken up during the decomposition of organic matters in presence of alkalies has been proven by different investigators by direct experiment, but Mons. Truchot endeavors to find proof of this fact by analyses of the soils themselves. The following table shows the results of his analyses referred to 100 grammes of soil :

A.—Meadow-lands not specially manured, but pastured with cattle.

No.	Soil of—	Nature of soil.	Carbon.	Nitrogen.	Remarks.
			<i>Grammes.</i>	<i>Grammes.</i>	
1	Royat.....	Granitic	6.120	0.445	
2	Clermont.....	Alluvial	4.920	0.452	Pastured.
3	Theix.....	Granitic	14.850	0.686	Not pastured.
4	Romagnat.....	Marly.....	3.500	0.420	Pastured.
5	Besse.....	Volcanic	11.880	0.940	Do.
6	...do.....	...do.....	12.900	0.760	Not pastured.
7	...do.....	...do.....	10.200	0.743	Not very fertile.
8	...do.....	...do.....	11.040	0.708	Pastured.
9	Puy de Dôme.....	...do.....	10.050	0.732	Fertile.
10	...do.....	...do.....	2.340	0.244	Sterile.

B.—Cultivated lands which have received ordinary manures.

No.	Soil of—	Nature of soil.	Carbon.	Nitrogen.	Remarks.
			<i>Grammes.</i>	<i>Grammes.</i>	
11	Aigueperse.....	Granitic	5.400	0.120	
12	Saint Benuet.....	Alluvial	1.800	0.194	
13	Bourgnon.....	Granitic	2.460	0.184	Strongly manured.
14	Chéry.....	...do.....	0.980	0.032	
15	Allagnat.....	Volcanic	1.764	0.082	
16	...do.....	Granitic	0.651	0.046	

Mons. Truchot says that many other analyses gave similar results. He has, therefore, evidently made selections from the results obtained to support his idea. Let us arrange his chosen results in the order of the increase of carbon in the soil, giving the figures alone.

For uncultivated soils.

Carbon.	Nitrogen.
2.34	0.244
3.5	0.420
4.92	0.452
6.12	0.445
10.05	0.732
10.2	0.743
11.04	0.708
11.88	0.940
12.90	0.760
14.88	0.686

For cultivated soils.

Carbon.	Nitrogen.
0.651	0.046
0.98	0.032
0.764	0.082
1.8	0.194
2.46	0.184
5.4	0.120

We see that there is in many cases for an increase of carbon an increase of nitrogen, but this is not the case in all the soils cited, nor do we find any direct ratio of increase. The soils of Besse, he says, merit particular attention, from the fact that at the very great elevation at which they are found, over three thousand feet above sea-level, with no

possibility of obtaining nitrogen from any external source other than the atmosphere, they produce sufficient herbage for pasturage of large herds of cattle throughout six months of the year, and contain a higher percentage of nitrogen than could by any means be supplied by the excreta of the cattle pastured there.

It might be objected that the nitrogen could be supplied by atmospheric ammonia produced at lower altitudes and carried up by the moisture that goes to form clouds; but this objection will not hold in view of the fact that the soil of Theix, found at an elevation of only 1,500 feet, contains nearly as much nitrogen as the soil of Besse. The other instances cited support this fact, and while we by no means dispute the agency of ulmic compounds in the appropriation of atmospheric nitrogen by the soil, and must acknowledge the value of Mons. Truchot's results, showing in some cases an increase of nitrogen with increase of carbon, we cannot fully agree with him in concluding from these results that "the amount of nitrogen contained in soils is in direct proportion to the quantity of carbon in the ulmic compounds they contain."

PHOSPHORIC ACID AS AN INDICATOR OF THE FERTILITY OF SOILS.—Mons. P. Truchot, in another paper, has discussed this idea in an exceedingly interesting manner, giving results of a series of analyses of soils of Auvergne, made with especial reference to it. Basing his estimations upon the fact that the three mineral ingredients of soils resulting from the decomposition of rocks which are of most value as fertilizers are lime, phosphoric acid, and potash, he obtained the results given below.

Granitic soils.—The granites of Puy-de-Dôme are almost entirely deficient in lime, and are poor in phosphoric acid, potash alone being present in notable quantity. The following are the results of estimations made upon the more or less decomposed friable rocks which form the subsoil of the cultivated soil, after having formed the soil itself:

	Lime.	Potash.	Phosphoric acid.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
1. Granite from Bourgnon, (Canton de St. Dier)	0.040	0.160	0.015
2. Granite from Trezioux, (Canton de St. Dier)	0.099	0.332	0.048
3. Granite from Montaigut	Traces	0.345	Traces.
4. Granite from Theix, (Canton de Clermont)	Traces	0.371	0.037
5. Gneiss from Chéry, (Canton de Sauxillanges)	Traces	0.115	Traces.

The soils resulting from the decomposition of these granites, or similar granitic rocks, are only slightly fertile, and require lime and phosphatic manures. The mean of analyses of twenty-three of these soils gives: Lime, 0.039; potash, 0.210; phosphoric acid, 0.053.

Volcanic soils.—It is quite different with volcanic soils, whether formed from basaltic rocks or modern lavas. The decomposition of rocks containing pyroxene and labradorite furnishes lime, so that such soils, although classified with the preceding as sandy, do not generally require an addition of lime. They contain a tolerably large amount of potash, and especially a large proportion of phosphoric acid.

The following are the quantities of phosphoric acid in several volcanic rocks:

1. Domite, from Puy-de-Dôme	0.096
2. Domite, from Buy-de-Dôme	0.109
3. Trachyte, from Mont Doré	0.217
4. Basaltic scoria, (Pont des Eaux)	0.512
5. Pozzolana, from Gravenoir	0.624
6. Lava, from Gravenoir	0.715
7. Lava, from Gravenoir, partly decomposed	0.742

The following are analyses of two volcanic soils:

	Limo, per cent.	Potash, per cent.	Phosphoric acid, per cent.
1. From Beaumont.....	1.6	0.226	0.403
2. From Aubière.....	2.6	0.160	0.304

These soils are very fertile in spite of a slight depth of the arable stratum. Judging from these figures, the author is led to conclude, with M. P. de Gasparin, that phosphoric acid, rather than potash, is the measure of fertility of a soil.

Soil of Limogne.—This soil is a rich alluvium, derived from the decomposition of all the rocks of Auvergne, the mud of ancient lakes, and even mineral-waters. The following are the results of three analyses of specimens of this soil taken from different localities:

		Mont De- sir.	Sarlieve.	Pont du château.
Physical analysis..	{ Stones	2.2	—	16.
	{ Sand	42.	4.	69.70
	{ Clay and fine sand	55.8	96.	14.30
		100.	100.	100.00
Chemical analysis..	{ Phosphoric acid	0.296	0.329	0.416
	{ Potash	0.548	0.385	0.280
	{ Lime	9.970	8.893	3.853
	{ Magnesia	1.850	0.005	0.762
	{ Carbonate of lithia	0.025	0.132	—
	{ Oxide of iron	13.1	7.3	15.330
	{ Chlorine	0.069	0.066	—
	{ Carbon	1.145	1.033	—
	{ Nitrogen	0.310	0.453	—

The thickness of the arable layer of this soil, often exceeding several meters, its looseness, as indicated by the physical analysis, &c., tend to make it very fertile; but if the proportion of phosphoric acid be considered, it will be observed that it is three times as great as that which characterizes the best soils. The black color and exceptional fertility of this alluvium would lead one to classify it with garden-mold, and to suppose it very rich in humus. But its amount of carbon derived from organic matters is small, and many less fertile soils contain much more.

The action of rocks in regard to fertility may be appreciated by examining the composition of the subterranean waters coming from them, and which are more or less efficacious when employed in irrigation. Some waters in the department of Puy-de-Dome have the reputation of increasing the fertility of the soils upon which they are used, while others are known to be almost without effect. As might be predicted, the first come from volcanic districts, the second from granitic. The following analyses confirm this supposition:

Quantities in one liter.

	Silica.	Lime.	Potash.	Soda.	Phosphoric acid.
	Milli- grams.	Milli- grams.	Milli- grams.	Milli- grams.	Milli- grams.
FROM GRANITIC ROCKS.					
1	40	Traces	2.7	2.0	Traces.
2	9	2.4	2.5	3.6	Traces.
3	29	25.	1.9	6.4	Traces.
4	23.5	13.5	8.2	13.5	Traces.
FROM VOLCANIC ROCKS.					
5	33	Traces	1.4	—	0.873
6	25	Traces	1.2	4.9	1.020
7	17	Traces	1.5	5.0	0.250

Thus the granitic waters, while quite rich in potash, do not contain any sensible amount of phosphoric acid. The volcanic waters, on the other hand, contain less potash, but about one milligram of phosphoric acid per liter. The author concludes, from these analyses and comparisons, that phosphoric acid is the principal element of the fertility of the soils mentioned, and that the volcanic soils owe their superiority in that respect, in a great measure, to the notable amount of that acid which they contain, which is rendered more easily soluble and assimilable by the presence of lime.

NITROGEN AND AMMONIA IN BEETS.—Messrs. Champion & Pellet have published the results of an investigation upon the subject of the percentage of nitrogen and ammonia contained in beet-roots, from which they conclude:

1. The soil and the percentage of nitrogen in the fertilizer employed being the same, the beets produced contain a larger percentage of nitrogen, according to the increase of the amount of sugar present.
2. With like quantities of sugar present in the beets, the nitrogen increases with the increase of nitrogen in the fertilizer employed.
3. The percentage of ammonia in the roots decreases with the increase of sugar.

The authors further state that these conclusions also hold good for sugar-cane.

IRRIGATION.—The question of irrigation has lately received some valuable attention at the hands of Mons. A. Le Play, who has made the utilization of drainage-waters from springs and the superficial waters accumulated during heavy rain-storms a subject of special study. His object was, not only to utilize the water for the purposes of irrigation, but also to prevent excavation of ravines on inclined surfaces by removal of large quantities of soil by the immense accumulation of water during the storms.

For this latter purpose he proposes to construct inexpensive trenches at regular intervals along the side of the hill, to collect the water at a given surface, to prevent an accumulation forming heavy streams, and to carry the water thus collected to the meadows requiring irrigation. The soil of the hill-sides, being composed principally of disintegrating and decomposing rocks, generally contains considerable quantities of lime, potassa, phosphoric acid, and nitrogen, and these matters, by the drainage and surface waters, may be distributed at will upon parts most needing them, while, if they be allowed to follow natural channels, they must be in great part lost in the lands of the immediate vicinity.

Monsieur Le Play claims, as an advantage of his mode of irrigation, that it avoids the possibility of close soils, the surfaces of which are considerably inclined, being cut up by large streams of water consequent upon heavy rains, and that therefore, independently of its importance in irrigating meadows, it very materially facilitates the cultivation of mountainous regions.

He conducted a series of analyses, the results of which, though forming a sound basis for his important deductions, have a local importance, and are therefore not suitable for abstraction. They show, however, that the richness of the waters thus collected varies according to the season, the inclination of the soil, the conditions of culture, and especially according to the conditions governing the system of manuring the fields through which they have to pass. He also found that the proportion of material of value as plant-food annually removed by water collected in these trenches, was far greater than could possibly be removed by the growth of different varieties of vegetation.



Cultivated varieties, (New Jersey.)

These facts appear very significant, and if some of our mountain-farmers will pay some attention to them, they will doubtless find the application of this system of great practical value, and will find in it a means of preventing the more valuable constituents of their soils being carried off by mountain-streams to the valleys below.

MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

[Continued from the October Report for 1875, page 445.]

Several members of the New Jersey Cranberry Association have expressed, by letters to this Department, a desire to know whether the color of the water on cranberry-plantations can be safely relied on as a test of the quality of peat-bottoms. Mr. James Fenwick, of New Lisbon, one of the most noted cranberry-growers of the State, writes to the Commissioner of Agriculture as follows :

I fear it may be thought by some that the statement which I made at the Cranberry Growers' Association, that the water in my bog was highly colored, and yet for twenty years I had never had any rot, was designed to disparage the opinion of the microscopist of the Department of Agriculture, in regard to that disease ; but it was not so intended. The association appeared to have the impression that the colored water was the cause of the rot ; an old idea started by some one who had white water on his plantation, to the injury of those who had colored water. I wish to say that the labors of the microscopist in this investigation have been fully appreciated by me, and that personally I am thankful to the Department for them ; but believing that the cause of the rot in cranberries in our pine region is generally owing to drought and high temperature, or flooding with heated or dead water, I am not disposed to change my views in this respect, and am still of opinion that his ideas as to the cause of the rot in Dr. Merriman's bog is correct, and that we are indebted to him for it. His recommendation to keep the water near the surface in irrigation is reasonable, because in drought poisonous substances, consisting of sulphureted hydrogen and organic acids, rise from below, and injure the plants. He has advised the use of lime.

Professor Mapes and many others have recommended lime slacked with salt, which substances produce, in the presence of decaying organic matters, furnishing carbonic acid, chloride of calcium and carbonate of soda in a cheap form. Would not these substances be better than lime alone ? And, in case of irrigation, would not a slow passage of water through the soil be preferable to flooding ? Thus, suppose two ditches be made two rods apart ; let the water be kept in them at a proper height to keep the ground moist, say one foot from the surface ; put another parallel ditch between them for a feeder, and keep the water up to the surface of the soil ; then there will be a motion of water through the soil toward the ditches on either side. In my judgment, this would be a great improvement on the present practice. It would supply moisture to the soil and have a tendency to carry off poisonous gases.

If Mr. Fenwick will review my papers published in the Department Monthly Reports for October, 1874, and January and October, 1875, he will find that my views are in accord with his as regards the causes which operate to produce cranberry-rot. I also consider that his views relating to drainage and liming are worthy of experiment, and I hope that he will assist in giving an early trial of them, and report the results to this Department.

The color of water or bog-land cannot be relied on as a test of the quality of peat-muck, inasmuch as color may be derived from a variety of causes. Bicarbonate of iron is soluble in water, producing a brown color. The coloring-matter of peat is also very soluble in solutions of soda, potash, and ammonia, forming deep, brown-colored solutions, and the salts of these alkalies have also a slightly soluble effect ; while with caustic lime the coloring-matter is precipitated, giving colorless solu-

tions, but the presence of sulphureted hydrogen in the soil will generally indicate when fermentation is in progress in the soil.

The composition of peat or mold varies with the nature of the plants which produce it. Plants containing tannin give an acid mold, while those which have no tannin form a mild mold more favorable to cultivation. The organic principles which are found in mold are ulmic acid, free or combined, in the latter case forming soluble ulmates, which are absorbed by plants during vegetation, and a black substance soluble in water, and called extract of mold, to which humus owes its color.

Although extract of mold is soluble in water, it should not be confounded with ulmic acid. It acts, during vegetation, by aiding in rapidly heating the soil which contains it, by absorbing moisture, by appropriating the elements of the atmosphere and of manures to form ammoniacal compounds, the nitrogen of which is easily assimilated by plants; and finally by giving rise to carbonic acid, which is dissolved by water.

In this condition, carbonic acid favors the earliest development of plants before the growth of the leaves; it dissolves the otherwise insoluble phosphates, it converts the insoluble earthy carbonates into soluble bicarbonates, thus enabling them to furnish to plants the lime and magnesia which they need.

ULMIC COMPOUNDS, OR PEATY MATTER.—Braconnet was the first to observe that in treating wood with potash a black acid, comparable to humus, was formed which he called ulmic acid. M. Chevreul also found that under the influence of the alkali the oxygen of the air is rapidly absorbed. Certain trees, and especially elms, exude a brown liquid which, according to the observations of Vauquelin and Klaproth, is an ulmate of potash and ammonia. The action of potash upon wood has been examined by M. Péligot. It results from the observations of this chemist that when a mixture of sawdust and potash is heated to about 300° , water, hydrogen, oily products, and wood-spirit are disengaged, besides which, carbonate, oxalate, formiate, and ulmate of potash are formed. Ulmic acid thus obtained will be yellow if the temperature at which the reaction takes place is not too high; but when the mixture is heated without precaution the acid is black. The final result of the decomposition of woody material by potash is carbon, and if the temperature were sufficiently high, hydrate of potash, acting as an oxidizing agent, might even cause the combustion of the carbon, in which case hydrogen would be disengaged. The yellow acid has been called *lignhumic acid*; the black acid, called *lignulmic acid*, forms with bases salts which have the general formula $MO, C^{54} H^{28} O^6$.

Lignulmic acid is brown, almost black; it is insoluble in water, but dissolves in concentrated sulphuric acid. It is soluble in alcohol; with alkalis it forms salts of a deep-brown color, which are uncrystallizable. The other lignulmates are insoluble, and may be obtained by double decomposition. M. Malogati obtained a black crystallized acid by heating on the water-bath for several hours a solution of sugar containing a small quantity of nitric acid.

M. Mulder has published a work on these black acids, of the principal results of which the following is a summary:

When a solution of 22 parts of sugar and 1 of sulphuric acid in 40 parts of water is heated to about 80° , a brown deposit is soon formed, which M. Mulder considers an ulmate of ulmine. This substance, treated with potash, yields ulmate of potash and leaves a deposit of ulmine, the composition of which is $C^{40} H^{16} O^{14}$. Ulmate of potash treated with

hydrochloric acids gives a brown, flaky precipitate of ulmic acid, which, being dried at 195° , is found to have the formula $C^{40} H^{14} O^{12}$.

When the mixture of sugar, water, and sulphuric acid is heated in a vacuum instead of under atmospheric pressure, a new compound is formed, which M. Mulder calls humate of humine. By acting upon this substance with a dilute solution of potash he separated the neutral body humine, which has for its formula $C^{40} H^{15} O^{15}$. Humine is evidently derived from ulmine by oxidation, one equivalent of hydrogen having been taken from ulmine and replaced in humine by one equivalent of oxygen. Anhydrous humic acid has for its formula $C^{40} H^{12} O^{12}$.

Under the influence of an excess of acid the preceding substances are changed into a black compound, insoluble in alkalies, the formula of which is $C^{34} H^{13} O^9$.

The compounds above described, treated with a current of chlorine in the presence of water, form a chloridized acid which is represented by the formula $C^{32} H^{12} ClO^{16} HO$, which M. Mulder named chlorohumic acid. Humate of ammonia, treated with chlorine, yields a compound still more highly chloridized, having the formula $C^{32} H^{12} Cl^2 O^{13}$.

According to M. Mulder, the black acids which are found in *peat*, in *rotten moss*, and in *arable soils*, are identical with ulmic and humic acids, which, in those circumstances, are combined with variable quantities of ammonia.

M. Mulder extracted from mold two acids in particular—*erenic* ($C^{24} H^{12} O^{16}$) acid and *apocrenic* ($C^{43} H^{12} O^{24}$) acid—which had been discovered by Berzelius in the waters of Porta, in Sweden, and in the ochreous deposits which furnish ferruginous waters.

Tobacco which has undergone fermentation for eighteen months—that used for making snuff, for example—contains a considerable quantity of a black acid which has not as yet been sufficiently studied, but which strongly resembles humic and ulmic acids in many of its properties.

We see then, to sum up, that these black substances result from the decomposition of neutral substances under the influence of acids and alkalies, or by the action of the *air* or *heat*. They may be *neutral* or *acid*. They frequently contain hydrogen and oxygen in the proportion in which those elements unite to form water. Those of them which combine with bases are to be considered as very feeble acids which always form, with alkaline bases, colored and uncrystallizable salts. These acids, in their general properties, present a certain analogy to the resins.

By acting on glucose with ammonia, either at 100° and at the ordinary pressure, or in closed tubes and at different temperatures, M. P. Thenard obtained brown substances soluble in water and in alkaline solutions, and which contain at least 10 per cent. *nitrogen*.

Dextrine, gum, starch, and cotton, treated with ammonia, gave M. Schützenberger analogous results. Thus gum, heated with ammonia in a closed tube for forty-eight hours, gave a residue containing from 2.5 per cent. to 3 per cent. nitrogen. Dextrine, heated under the same conditions for one hundred and sixty-eight hours, gave a substance which contained 11.5 per cent. nitrogen.—Peluze and Frémy.

As the successful cultivation of the cranberry depends much on the condition of the peaty matters of the bog-land used, it is imperative on those who desire to become successful growers to make themselves thoroughly acquainted with the chemical properties of peat. Many suppose that it is necessary to have the roots of the cranberry-plant imbedded in peat, losing sight of the fact that soluble and colorless fertilizing compounds are formed from the decomposition of woody or peaty matters which are easily conveyed through sand to the roots.

From the numerous experiments and observations I have made, I am convinced that the roots are injured by direct contact with decomposing, or even well-decomposed peat. Fresh, moist peat, pressed on litmus paper, gives at once the reaction of an acid, even when a solution of the same will scarcely indicate its presence. Roots growing in peat have always a blackened color, although well washed, indicating the presence of an oxidizing agent; but when growing in clear sand over peat-bottoms or in gray moss, they are of a whitish or pale-yellowish color, indicating the absence of acid, and also showing a healthy growth.

Some specimens of native peat, analyzed in the laboratory of the Department, have given a larger per cent. of ammonia than some of commercial poudrette; and it is probable that the ammonia, disengaged from well-decomposed peat, existed in the form of a salt, and not as nitrogen in an albumenide. In the form of a soluble salt, it would come in contact with the roots by the capillary action of the sand. It is in this way that peat-bottoms have their value under sand. A microscopic examination of the dark-coloring matter found on the roots, after all the mechanical coloring matters had been removed, showed that their surface was chemically changed, that is, carbonized.

Cranberry illustrations.—Figures 1, 2, 3, 4, 5, and 6 represent the leading types of cranberries cultivated in New Jersey, which are known by the following names, viz: 1, the bell; 2, the cherry; 3, the bugle; 4, the red early bell, from Cape Cod, as found growing in New Jersey; 5, the cheese berry; 6, a modification of the bugle; 7, roots of the healthy vine, intermingled with moss.

Insects injurious to cranberry-culture.—The following letter relating to insects injurious to cranberry-culture is written by the secretary of the New Jersey Cranberry Association, at the request of this Department:

TRENTON, N. J., January 25, 1876.

DEAR SIR: I subjoin a few facts, drawn from experience and observation, concerning the insect-enemies common to the cranberry. Those with which we have had special experience are the grasshopper, cricket, vine-worm, and berry-worm. We have succeeded in destroying these worms by thorough plowing. On a portion of the park cranberry low lands they at one time became very numerous in spite of the ordinary winter plowing, but by removing the water and exposing the lands for a few weeks to the rays of the sun in April, and then again submerging them, the worms were completely destroyed. When water is not at command for flowing we think they may be controlled by night-fires on the borders of the bogs at the period when the moth is out. Many moths are destroyed by the flames, and more are attracted away from the plantation by the light that do not find their way back.

Grasshoppers and crickets have given us the most trouble. Their eggs being impervious to water cannot be destroyed by winter flowing. If they could be submerged at the period of hatching we have no doubt that they would succumb, but the hatching occurring at a period when the vines are in bloom and setting with fruit, flowing cannot be employed without loss of the crop. Poultry of all kinds we have found very beneficial in keeping the grasshoppers in subjection; but we have found no animal sufficiently sharp-eyed to capture the hiding cricket except the Guinea fowl. Both the grasshopper and the cricket are fearfully destructive, as the former attacks the berry when very small, and the latter eats only the seeds at the time of ripening.

If you can give us any assistance by way of remedy for these pests we shall be greatly obliged.

Respectfully,

A. J. RIDER.

Hon. FREDK. WATTS,
Commissioner of Agriculture.

PENICILLIUM GLAUCUM.—Under the head of microscopic investigations will appear, from time to time, in the monthly reports of the Department, a series of illustrations of finely-executed engravings, representing the most important types of cryptogamic plants and including edible



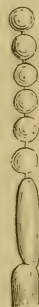
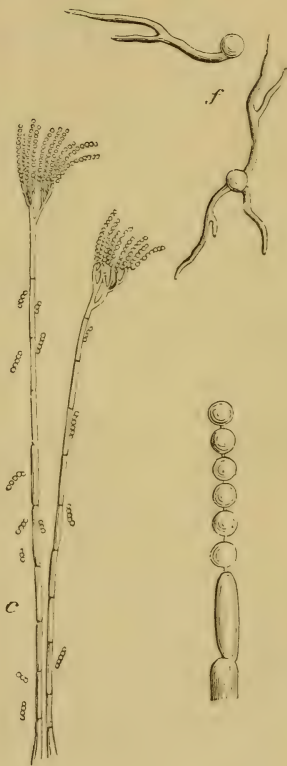
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and poisonous mushrooms. About 500 highly-executed colored drawings have been prepared for the International Exhibition, under the supervision of some of the most noted cryptogamists of Europe and America, from which collection specimens will be selected for publication.

We make our first selection, blue-mold, (*Penicillium glaucum*, Grev.,) from a class of common molds which are frequently found on moldy bread and other articles of food, and appear of a greenish or blue color. This genus is supposed to have intimate relations to fermentation; *a*, represents the appearance of the fungus to the naked eye, on a piece of bread; *b*, tuft enlarged; *c*, threads enlarged 420 diameters; *d*, apex x 620; *e*, chain of spores further magnified; *f*, spores germinating.

The drawing is after an original, by M. C. Cooke.

FACTS FROM VARIOUS SOURCES.

CONNECTICUT AGRICULTURAL EXPERIMENT STATION.—The Wesleyan University, of Middletown, Connecticut, has tendered the use of its grounds, cabinets, and laboratories for the use of this new institution, of which Dr. Atwater, the distinguished professor of chemistry of the university, acts as director. Dr. W. C. Tilden, late of this Department, is the acting chemist, with two assistants. The State appropriates annually \$2,800, and the American Agriculturist enough to pay the balance of salaries and expenses. Dr. Atwater gives his services as director without charge. At a late joint meeting at the station, of the State Board of Agriculture and the Farmers' General Committee, Dr. Atwater presented statistics from seventy European agricultural stations, showing that not a dozen of them were better equipped for work than was the Connecticut station. The work of the station has been commenced, and already some of its valuable features have been developed. Numerous analyses of fertilizers have been made, one of which shows that the article in question, though sold with strong recommendations, contained 1,300 pounds of sand, gravel, and other worthless material, to the ton. Analyses of general utility are to be made gratis; those of private interest at moderate charges.

NEW JERSEY CRANBERRY ASSOCIATION.—At a recent meeting of this association, Mr. N. R. French reported the statistics of cranberry production as follows:

In round numbers I think the area under cranberry culture in New Jersey at the present time is 5,000 acres, and the cost thereof at the fruit-bearing age of the vine (three years) \$1,750,000. New England and New York—judging from their crops, aggregate about the same acreage, at probably about the same cost. Wisconsin, Minnesota, Indiana and Michigan, probably have 5,000 acres in cranberry vines, either partially or wholly cultivated, but the cost at the fruit-bearing age is presumably less than half that of the same area in the Atlantic States. We may say then that this country has 15,000 acres in cranberry culture, at a cost valuation of \$4,375,000. The estimate crop of the last four years is as follows:

	1872.	1873.	1874.	1875.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Cape Cod and adjacent islands.....	20,000	80,000	70,000	50,000
Massachusetts, Rhode Island, and Connecticut.....	20,000	25,000	35,000	25,000
New Jersey.....	100,000	110,000	90,000	90,000
Wisconsin, Minnesota, Indiana, and Michigan.....	135,000	60,000	50,000	40,000
New York.....			5,000	5,000
Totals.....	275,000	275,000	250,000	210,000

TRAINING OF HORSES.—The following letter was received from a regular and valued correspondent of this Department. It inculcates valuable lessons in the rearing and training of young horses, the proper mode of feeding, and systematic gentleness in handling and teaching. The value of the horse depends so much upon his early training that I give place to this letter because of the valuable lessons it teaches:—[*Commissioner of Agriculture.*

HACIENDA SALUDA,
Greenville County, S. C., December 24, 1875.

SIR: On the 11th December last I purchased two more colts born 4th and 7th May, 1874—both from the same horse—their mothers sound brood-mares of this county. The colts were weaned at seven months old, wintered on corn-fodder and clover-hay, with two quarts per day of corn-meal, moistened with warm water and a little salt. They ran out all winter in a 20-acre hilly lot of ground, with steep gravelly paths to water. At night they nestled together on a warm littered-stable wooden floor, coats cleaned and feet trimmed.

In March, as soon as they began to get a little pasture, they were haltered and tied up in their stalls. In June they were bridled, surcirkled, and cruppered. In two days running loose the bit worked in the mouth and crupper at the root of the tail in such a way as to make them hold up their heads and do all the kicking natural to youth and inexperience. They were then learned to stand tied in this way for three hours each day for a week, another week with wagon-harness, collars, breeching, and chain-traces dangling about their hind legs sufficient to teach them patience.

In July they were driven double up and down hill; then hitched single to a horse-rake, pulling hay together; then to a little cart, one ahead of the other, hauling light loads of hay to the barn, at which work they were prepared for the road as a tandem team; then put to a small garden-plow, single and double. Sweating cleansed their bowels, gave them a fine appetite, and made them grow rapidly in size and strength.

In August they were taught to shake hands before going to supper, by offering one fore foot. Driven double out on the road to visit a steam-sawmill, heard the noise of machinery, and became familiar with the whistle of the locomotive. During September they carried sixty-pound boys every day for two hours up and down the road inside the front gate in a slow walk, then in a fast walk up and down hill, then in a slow trot and fast trot on a level; this kept them a little thin in the hot season, but they were growing at the rate of half an inch per month, having reached the height of 4 feet 9½ inches, keeping nearly the same size.

In October they were allowed a vacation of two weeks, in a third crop of clover, a foot high, with an additional allowance of salt to prevent slobbering; before being set free in the mornings, they were requested to bow their heads to the ground in supplication, which they soon learned to do with profound understanding. They had not been in clover long before they filled, and lay down on their mother earth and went to sleep.

In the last week in October they were hitched to the Baltimore wagon, and driven eight miles, working well up and down hill, and on a level showed how well they had been trained to trot by the boys. They were now turned on Kentucky blue-grass a half a foot high. At eighteen months old they were hitched to the high Greenville road-wagon, and visited the city, to and fro fourteen miles. On this drive they showed the result of a home education, crossing streams and bridges and passing strangers with a grace and beauty equal to colts of their age of any other country.

Amazon (named after the South American valley) is the favorite.

Tecla (named after the fair maid of Iconium, referred to in Apocryphal New Testament, who was persecuted without mercy by magistrates of antiquity,) is the pet. She shows pluck on the road, and traveled the fourteenth mile with much spirit, though she may not prove so fast as Amazon.

The importation and employment of jacks injures and weakens the race of horses. A young horse, with elder brothers and sisters mules, is often abused for stupidity, or a wild vicious character which turns his heels against mankind. The well-trained, pure blooded horse, is now so valuable, and the mule comparatively so cheap, that the horse is being destroyed by the jackass.

Very respectfully,

LARDNER GIBBON.

OUR SILK MANUFACTURE.—From returns received by the Silk Association of America from the silk manufactories of the country, the following statistics have been compiled. The total value of our domestic manufacture, during 1874, was \$20,082,482, viz: tram and organzine, 375,659 pounds, \$2,911,055; spun silk, 140,000 pounds, \$800,000;

fringe-silk, 18,845 pounds, \$109,270; floss-silk, 6,300 pounds, \$43,000; sewing-silk, 82,857 pounds, \$917,809; machine-twist, 414,285 pounds, \$4,848,839; dress-silks, \$1,400,000; millinery and neck-tie silks, \$1,163,961; handkerchiefs, \$313,315; foulards, \$500,000; ribbons, \$2,776,836; braids and bindings, \$308,790; laces, \$103,000; veils and veiling, \$33,706; military trimmings, \$68,000; upholstery trimmings, \$340,000; ladies' dress trimmings, \$3,444,700. In this manufacture were consumed 897,946 pounds of reeled silks, worth \$8,829,973; 140,000 pounds of spun silks, worth \$800,000, making 1,037,946 pounds of silk thread, valued at \$9,629,973. Of this amount 497,142 pounds, worth \$5,766,648, were consumed in sewings and twist, leaving but 540,804 pounds, worth \$3,863,325, for woven fabrics. The total amount paid for wages was \$4,497,319, making an outlay for labor and raw material of \$14,127,092, leaving a balance of \$5,955,390 for profits and expenses of administration. The total amount of capital invested was \$14,708,184, which, divided among 180 establishments, gives an average of \$81,716. The average of annual products was \$111,569. The total number of hands employed was 14,479, averaging 80 to each establishment; of this number 4,086 were males above sixteen; 1,048 males under sixteen; 6,858 females above sixteen, and 2,487 females below that age.

Of the different branches of this industry, thrown and spun silks embrace 26 establishments, half being in New Jersey, with machinery of 1,003 horse-power, driving 129,178 throwing-spindles; the number of hands employed was 4,062; amount paid for wages, \$945,710; capital invested, \$4,252,152; total product, \$3,863,325, including tram and organzine, \$2,911,055, spun silk, \$800,000, fringe-silk, \$109,270, and floss-silk, \$43,000; total weight of product, 540,804 pounds. It is noticeable that the two establishments of Connecticut produce about two-thirds of the aggregate of the 13 establishments in New Jersey, with less than a third of the spindles and two-thirds of the horse-power; but the capital invested in the Connecticut factories is \$1,767,300, against \$1,577,070 in those of New Jersey; New York has 4 factories, Pennsylvania 6, and California 1; but these are on a smaller scale.

Sewing-silks and machine-twist occupy 42 factories with machinery of 605 horse-power, driving 39,665 spindles; number of hands employed, 3,212; aggregate of wages, \$793,391; capital invested, \$3,586,996; total value of products, \$5,776,648, including sewing-silks, \$917,809, and twist, \$4,848,839; total weight of goods produced, 497,142 pounds. Massachusetts, with 7 factories, produces about two-fifths of this aggregate, \$2,072,163, and has the largest amount of capital invested, \$1,258,290, as well as the largest number of hands employed, 1,146. Connecticut, with 19 establishments, employs 1,051 hands, and produces \$1,904,885 from an invested capital of \$1,153,433. New Jersey has 6 establishments; New York 5; Pennsylvania 2; California, New Hampshire, and Vermont 1 each.

Broad goods and ribbons employ 42 factories with machinery of 355 horse-power, driving 1,189 power-looms and 496 ribbon power-looms. There are also 779 hand-looms, and the average number of shuttles of each establishment is 7,935; number of hands employed, 4,092; total of wages, \$1,201,579; capital invested, \$2,836,696; total production, \$6,154,313, including dress-silks, \$1,400,000; millinery and neck-tie silks, \$1,163,961; handkerchiefs, \$313,516; foulards, \$500,000; ribbons, \$2,776,836. New Jersey, with 21 factories, produces nearly half of this aggregate, \$2,987,467, employing 2,255 hands, and \$1,492,584 of capital, and paying for labor \$616,588. New York, with 11 establishments, and Connecticut, with 2, produce each about half as much as New Jersey

Pennsylvania has 6 establishments, producing millinery and neck-tie goods and ribbons. Massachusetts and Kansas have 1 each, fabricating only ribbons.

Forty firms are engaged in dyeing either their own products or those of others. They have \$386,840 invested in dye-works, employ 360 men, pay \$205,719 for labor, and dyed 1,037,946 pounds of silk during the year.

In the manufacture of laces and braids, 92 firms are employed, 56 in New York and 14 in Pennsylvania, with 392 power-looms, 728 hand-looms, 45,148 braiding-spindles, 180 chenille-spindles, 287 cord-spinning wheels, and 50 lace-machines; number of hands employed, 2,753, (two-thirds females;) wages paid, \$1,350,920; capital invested, \$3,645,500; total product, \$4,298,196, including laces, \$103,000, (all in New York;) braids and binding, \$308,790, (all in New Jersey and Connecticut;) veils and veilings, \$33,706, (all in New Jersey;) military trimmings, \$68,000, (all in Pennsylvania;) upholstery trimmings, \$340,000; ladies' dress-trimmings, \$3,444,700.

The 180 establishments were scattered through 13 States, of which New Hampshire, Maryland, Vermont, Missouri, and Kansas, had but 1 each; Illinois 2; Ohio and California 3 each; Massachusetts 11; Connecticut 21; Pennsylvania 23; New Jersey 42; New York 70. New Jersey has the largest amount of capital invested—\$4,193,942, or over a third of the whole—and reports the largest product, \$6,097,692, nearly a third of the whole; she employs, also, over a third of the laborers—5,714. Her 42 establishments average \$145,183 of manufactured products, \$99,858 of capital invested, and 129 employés. Her enterprise is mostly directed to thrown and spun silks, broad goods, ribbons, laces, braids, and trimmings.

Connecticut ranks next in the extent of production and capital embarked. Her 21 establishments show the largest averages reported, viz: Capital, \$186,381, value of products, \$241,710, employés, 126. Her chief enterprise embraces thrown and spun silks, sewing-silks, twist, broad goods, and ribbons.

New York, with the largest number of establishments, ranks only third in capital and production; her 70 factories average \$48,168 in capital invested, \$64,238 in annual production, and 48 hands employed; 56 of her establishments manufacture laces, braids, and trimmings, in which branch she takes the lead, and produces more than half of the whole.

The 23 factories of Pennsylvania, employed mostly in the fabrication of laces, braids, trimmings, broad goods, and ribbons, average \$66,846 of capital, \$81,597 of products, and 67 employés. Massachusetts takes the lead in sewing-silk and machine-twist, producing about two-fifths of the whole; her 11 establishments average \$122,981 of capital, \$197,151 of products, and 113 employés. Ohio manufactures only ladies' dress trimmings and upholstery trimmings; her 3 establishments average \$14,000 of capital and \$20,000 of products, employing altogether 100 hands. California has 3 factories, producing tram, machine-twist, and ladies' dress and upholstery trimmings; they average \$54,000 of capital, and \$36,766 of products, employing together 100 hands. Illinois has 2 establishments engaged in manufacturing ladies' dress and upholstery trimmings; together they report \$32,500 of capital and \$50,000 of products, and employ 35 hands. New Hampshire has 1 factory, producing machine-twist and sewing-silk to the amount of \$44,000, employing a capital of \$27,000 and 19 hands. Maryland, with 1 factory, employing \$30,000 capital and 25 hands, produces \$35,000 worth

of ladies' dress trimmings. Vermont has 1 manufactory of machine-twist, with \$14,200 capital and 8 hands, yielding \$15,000. One firm in Missouri manufactures ladies' dress trimmings and upholstery trimmings to the extent of \$15,000, with \$10,500 capital and 13 hands. Finally, one establishment in Kansas weaves \$7,500 worth of ribbons, with a capital of \$10,000 and 6 hands.

The weekly wages of male employés range about as follows: mill men and boys, from \$5.75 @ \$8 in New Jersey, to \$6 @ \$12 in Connecticut; cleaners, from \$1.80 in California to \$5 in Connecticut; weavers, \$12 to 18, (the highest rate only in Connecticut;) dyers from \$12 @ \$15 in New Jersey and Pennsylvania, to \$16 @ \$25 in New York, (California \$24 in gold;) stringers, from \$12 to \$18, (highest rate only in California;) laborers, from \$8 @ \$10 in Pennsylvania, to \$10 @ \$12 in New York; lace-machine men, (only employed in New York,) \$12 to \$30. Female wages range as follows: danterers, from \$5.50 @ \$6.50 in Pennsylvania, to \$9 in California; winders and doublers, \$4.50 to \$10; cleaners, \$1.80 to \$5; reelers and quill-fillers, \$4 to \$7; spoolers, \$6.50 to \$8; weavers, \$7 to \$12; tassel-makers, \$4 to \$7.50. The hours of labor are 60 per week. In many instances operatives of special skill will make much more than the above, especially soft-silk winders, warpers, and weavers who work by the piece or pound; such frequently earn \$12 to \$15 per week, while male weavers often reach \$20, and passementerie-workers \$30; the best silk-finishers reach \$36.

The reports of the Bureau of Statistics of the Treasury show the following imports of raw silk by fiscal years: 1870-'71, 1,100,281 pounds, worth \$5,739,592; 1871-'72, 1,063,809 pounds, worth \$5,625,620; 1872-'73, 1,159,420 pounds, worth \$6,460,621; 1873-'74, 794,837 pounds, worth \$3,854,008; 1874-'75, 1,101,681 pounds, worth \$4,504,306. The imports of the calendar year of 1874 were 806,774 pounds, valued at \$3,826,905, against 831,728 pounds, worth \$4,267,243, imported in 1873. Over 99 per cent. of these goods were entered at New York and San Francisco. The report of the Silk Association embraces a paper showing that the raw silk-trade of 1874 was marked by full crops, low prices, and large consumption by manufacturers. In the face of a decreasing import this can be explained only on the supposition of an increased home-production. China, now happily freed from her devastating rebellion, has increased her annual product and export. The report, however, publishes facts showing that the Chinese article has suffered a continued adulteration and deterioration. In response to the demands of foreign consuls the Chinese government issued a proclamation calling upon the officials of the "silk-district" to see that due care be exercised in the selection of fiber for export, and that energetic measures be taken for its improvement. In Japan, of late years, the raw-silk trade has been nearly undermined and demoralized by the extraordinary foreign demand for silk-worms' eggs. This caused the increase of worms beyond the power of the rearers to properly care for them. A great degeneracy of the next generation was the natural consequence, involving a similar degeneracy in the cocoons. But these results have produced a reaction in the business, and now more attention is given to the breeding of sound, healthy worms. Machinery is also superseding hand-work in reeling, producing more even and stronger fiber with fewer breaks. The entire Japanese product of raw silk in 1874 was about 3,000,000 pounds. The silk produced in spring is stronger and less liable to break, but that of summer is of brighter color; a little inferior silk is produced in the fall. From facts presented by the Japanese vice-consul at New York, it is expected that the Japanese silk will become as good as that of any other

country for American manufacture, when the Japanese understand the requirements of our market. We demand the best and strongest fiber. In Europe the crop was good notwithstanding the yield of cocoons from imported Japanese eggs was poor. The Bengal silks were inferior.

The prices of raw silk ruled lower than for twenty years, shrinking from 30 to 45 per cent. within two years. These low prices have been maintained in spite of increased consumption and the rapid decrease of manufacturers' stocks.

The aggregate annual values of silk manufactures imported at New York during the last sixteen calendar years were as follows: 1859, \$31,877,863; 1860, \$34,320,331; 1861, \$12,293,863; 1862, \$10,942,938; 1863, \$14,761,186; 1864, \$14,621,202; 1865, \$18,293,693; 1866, \$22,962,864; 1867, \$16,434,524; 1868, \$18,903,232; 1869, \$22,064,312; 1870, \$26,731,275; 1871, \$33,899,710; 1872, \$32,677,749; 1873, \$24,379,322; 1874, \$23,292,551. From .92 to 95 per cent. of the manufactured-silk imports of the whole country are received at New York. These figures represent the foreign (gold) cost of the fabrics.

ANGORA MANUFACTURES IN CALIFORNIA.—California, in pursuance of a characteristic fashion of doing what cannot be done elsewhere, has not only persisted in keeping considerable flocks of Angora goats, but multiplies their numbers and utilizes the fleece. There have been placed in the Museum of this Department some specimens of dressed skin with fleece intact, of divers colors and great beauty, such as are used for fancy robes, rugs, mats, fur gauntlets, and for other purposes. These gloves are very strong, durable, warm, and showy. The leather is also used in strings for belt-lacing, and appears from its great strength to be very suitable for such use. This is the work of the Angora Robe and Glove Company, located at San José, and demonstrates the availability of Angora products for successful manufacture into articles of comfort and utility. Their gloves, unlike those of buckskin, are dressed with the grain left on. Mr. Frank Leavis, the secretary of the company, is a part owner of a flock of six hundred ewes which were sheared last spring. In one county, Monterey, there are no less than twenty thousand returned by the assessors, and they constitute a portion of the stock of twenty-eight other counties.

CHEESE IN MINNESOTA.—The statistics of the Bigelow Cheese Factory, in Noble County, Minnesota, reported to this Department for 1875, are as follows: Number of pounds of cheese manufactured, 15,520; average value per pound, 12½ cents. The factory was in operation four months, during which time it received the milk of eighty cows. The average number of pounds of cheese per cow was 194, amounting in value to \$24. Our correspondent in Stearns County also reports that the farmers are turning their attention to cheese-making, and that a factory for that purpose has been established in the county the past season.

PEELER COTTON.—A correspondent in Drew County, Arkansas, reports that from a package of seed received from this Department he had grown enough to sow about an acre of this variety of cotton, last spring. He sold the product of lint at 14½ cents per pound, "while other cotton, raised by its side, handled with the same care, and sold at the same time, brought only 12 cents per pound." He has carefully saved the seed of this crop, some of which he will distribute among neighbors, and plant the remainder for further testing its comparative merits.

FRUIT IN MICHIGAN.—The quantities of fruit reported as shipped by

rail and water from Saint Joseph and Benton Harbor, the past season, were as follows:

	Saint Joseph.	Benton Harbor.
Apples, barrels	18,773	48,831
Apples, baskets	10,648	.....
Pears, baskets	12,918	.....
Fruit—peaches, plums, cherries, grapes, quinces, &c., baskets...	35,294	47,785
Strawberries, crates, (one-half bushel)	130,092	.....
Berries, crates	38,248	2,937
Preserved fruits, barrels .....	.....	292

“DESICCATION OF FRUITS AND VEGETABLES.”—In the article under this head in the volume of Monthly Reports for 1875, the statement, on page 508, that “letters-patent were granted to A. J. Reynolds, of Baltimore,” should read “to A. J. Reynolds, of Chicago.”

RENEWED IMMIGRATION INTO KANSAS.—A correspondent in McPherson County reports that the abundant crops of this season “have caused immigration to start up again.” He states that Russian immigrants are coming into that vicinity and buying up all the railroad and school lands in the market. As a consequence, the locality is becoming thickly settled.

PROGRESSIVE FARMING.—A correspondent in Ingham County, Michigan, reports a growing conviction in that section that good farming, and only that, is profitable. The breeding of fine sheep, cattle, and farm-horses is receiving increased attention, and unusual exertions are being made to introduce the best labor-saving machines and implements.

BLUE-GRASS.—Our correspondent in Prairie County, Arkansas, reports that Kentucky blue-grass was brought into that county by the Army, and has since been spreading all through it, though very little has as yet been sown. “It is rapidly running out the wild grasses, with the exception, perhaps, of wild clover, of which there are two varieties.” He is of opinion that, for all purposes, it is superior to every other grass in the county, though timothy, red-top, orchard-grass, and clover are cultivated, and successfully, by those who have the requisite knowledge for right treatment.

INCREASING PRODUCTION OF SORGHUM IN GEORGIA.—The State department of agriculture at Atlanta reports that the yield of sorghum this year will average in the State 73 gallons per acre, and the product will be 323 per cent. greater than last year. This is owing to a greatly increased acreage and to a very favorable season, particularly in Upper Georgia, where the culture is rapidly extending. The area reported in 1874 was 5,134 acres, and the average yield 67 gallons per acre. This gives a product of 343,978 gallons. An increase of 323 per cent. on this gives 1,455,027 gallons. The average price per gallon is 66 cents; the estimated cost of production per gallon 28 cents; making the gross returns per acre \$48.18, and the net \$27.74. That is a return of very nearly 136 per cent. on the investment in fertilization, seed, labor, &c. But it is presumed that the estimated cost of production does not take into account interest on the value of land, and its relative conditions before and after producing the crop. At the above estimates, the gross returns for the crop would amount to \$960,317, and the net \$536,910.

AGRICULTURE IN DOUGLAS, COLORADO.—A correspondent in this county reports that "the grasshoppers made a clean sweep of everything," except potatoes, which were an extra crop. During a residence of fifteen years he has never known such a failure, and he predicts that "a great many will have hard work to pull through till another crop." On the other hand, the loss of crops is in part compensated for by an unusually good market for cattle. Nearly all beef-cattle had been sold for Chicago market previous to November 13. At that date, also, grass was unusually good, and there was more than an average prospect that stock would winter well.

BROOM-CORN.—It is but a very few years since the importance of the extensive cultivation of broom-corn has attracted the attention of either the farmer or manufacturer; but now in the Northern, Western, and Middle States it has grown into an important industry; and there is no reason why the Southern planter should not turn his attention to the same subject, and thereby awaken another manufacturing occupation among his people. There is no climate in the United States in which broom-corn will not grow with more or less success; and the mode of its cultivation does not materially differ from that of the ordinary corn or maize. And, like all other grain, its successful production is dependent upon the quality of the soil and the care with which the land is cultivated.

For broom-corn the land should be plowed in the fall. This attains two objects: the frosts of winter ameliorate and make friable the soil; and the work is then done, and will not be liable to the delay of planting early in the spring. This is particularly necessary in the Northern and Middle States, where spring-sowing is often delayed by cold rains. If the ground be well and deeply plowed in the fall, it will supersede the necessity of plowing it again in the spring. The ground may be then well harrowed, rolled, and scored out three feet one way and two the other. This is assuming that the ground is in good, fertile condition. If it be not, then it should be made so before plowing in the fall, by the application of barn-yard manure. Land cannot be made too rich for corn. Scoring the land out both ways enables the farmer to work it both ways by cultivators. If the seed be dropped with a drill, then it need not be scored. About three quarts of seed will plant an acre. As soon as the corn is seen above the ground, the working to keep down the weeds should be commenced, and it must be kept clean throughout the season.

Broom-corn will grow from eight to twelve feet high, and its brush should be two feet long. This, however, is dependent in a great degree upon the quality of the soil and the care with which it is cultivated. After the corn is grown to full size, the top is bent down at a point about one foot below the brush. This is for the purpose of preventing too much spreading; and it should be so bent that it may be as little exposed to the sun as possible, in order to preserve its color. Whether this operation of bending down the top be done before or after the ripening of the seed, must be made to depend upon whether it be most desirable to perfectly ripen the seed or secure the best quality of brush. The plant being ripe and properly dry, the brush is to be cut off and hauled to the barn, and the seed taken off either by a hackle or other machinery.

The character of broom-corn has, of late years, been much improved in length and stiffness, and persons desirous of raising it should pay much attention to the character of the seed. The brush for several years back has been worth in the market from six to twelve cents a pound, and the seed is worth about as much as corn for the feed of cattle.

There are large manufactories of clothes and sweeping brooms in New York and Massachusetts, and the product of the broom-corn is always a marketable article. Some estimate may be made of the profit arising from the cultivation of broom-corn, from the reports made by the farmers of Massachusetts and New York to their respective agricultural societies, as the same are published in their annual transactions.

The value of the crop is reported by the Massachusetts Agricultural Society as follows:

1,159 lbs. of brush, at 7 cents	\$81 13
88 bushels of seed, at 45 cents.....	39 60
	120 72
Expenses:	
Manure	\$10 00
Plowing and planting.....	3 00
Cultivating, harvesting, and taking of seed.....	18 00
Interest on land.....	9 00
	40 00
Net profit on one acre.....	80 72

PURIFICATION OF SEWAGE.—Dr. Carpenter, in a paper read before the British “Association of Medical Officers of Health,” states that infiltration of sewage through soil will eliminate all organic matter, and perfectly purify it. But the power of the soil is limited. It becomes saturated, and, instead of purifying the sewage, pollutes it still further by infusing the organic *débris* left by previous infiltrations. But if the filter is changed and the soil allowed to sun-dry and come in contact with fresh air, the organic *débris* itself is oxidized and transformed into harmless salts, which, on subsequently passing the sewage through the filter, will be carried off, leaving the filter itself free from its previous contamination. This is the principle on which rests the new process of downward, intermittent filtration. These salts are carried off into the sea, and consequently lost to agriculture.

To prevent this waste it is proposed to take up these organic *débris* in the filtering soil by vegetation. Instead of the chemical power of the atmosphere, the vital power of the plant should be brought into requisition to remove this refuse matter, and to bring it back by its circuitous process into the soil. In 1868 the speaker had showed how the rootlets of rye-grass seized upon the organic elements of the sewage, without reducing them to chemical salts, and immediately utilized them in plant-growth. He maintained, contrary to common opinion, that it was not necessary that the organic refuse should be reduced to inorganic elements prior to re-absorption in vegetation. He cites, in support of his position, the experiments of Dr. Sanderson, and the declaration of Dr. Hooker, of the Royal Gardens at Kew, before the British Association, at its late session in Belfast, that “plants can and do assimilate animal matter without that animal matter being first resolved into its ultimate elements.”

Dr. Carpenter claims to have established the capacity of the protoplasm of rye-grass, as existing in the minute spongioles of the root, to absorb and assimilate organic matter without first decomposing it into its inorganic elements. At the extreme end of the rootlet, the root-cap, as it is called, consists of cells which attract this organic matter, and which, after having passed the nitrogenous elements to the vascular system of the plant, become saturated with the residuary oxygen or carbonic acid and separate from the plant, their work being done. Animal manure, especially that derived from carnivorous or omnivorous animals, embraces two classes of matter; first, that in which all vitality has been destroyed,

and which reverts to the inanimate compounds which the chemist can reproduce in his laboratory; secondly, that which contains granules or germs with a dormant or potential vitality of some sort. The latter is called, by Dr. Beale, "living matter," and requires a continuous heat of 212° Fah. for its destruction. These are the germs which, if admitted into the animal organism, reproduce their kind, and by their organic action disturb the normal relations of the animal system producing disease. If, now, it can be shown that vegetation arrests these mischievous germs or granules, a sanitary expedient of immense value has been developed. Dr. Carpenter cites Dr. Sanderson and Charles Darwin in proof of the actual absorption of this organic matter by the *Drosera*, and claims the same in behalf of the rye-grass. A field of thin grass deprived of its accustomed sewage for three or four days, shows a vast mass of tangled rootlets covered with hairs. As a stream of sewage is turned upon the latter they will exhibit, under the microscope, a marvelous activity. They extend their fibrillæ to reach the advancing tide. Immediately a liquid, which is not sewage, rises in the parenchyma of the plant.

A serious question has been raised, as to whether the absorption of injurious matter by the earth as a filter finally disposes of it, or only holds it in reserve for future injury. Dr. C. thinks that all possible danger from this source can be removed by this absorptive power of vegetation, so far as sewage is concerned. Plants will extract the nitrogenous elements of organic matter, and thus deprive it of all vitality. Not a single granule can escape this action, provided the soil is not already saturated with sewage. Rye-grass sown in wet sand, without contact with water containing nitrogenous matter, will grow to a certain size, and stop when it has used up all the nourishing matter contained in the seed. Upon the application of water, charged with fresh solutions of organic matter, the plant again begins to grow. If organic solutions be placed in sand in which there is no absorbing vegetable, such as rye-grass, it will become putrid. These facts Dr. C. claims to have established by decisive experiment.

In regard to the healthfulness of plants raised from sewage, for human consumption, Dr. C. admits that an excess of sewage injures plants, but contends that some plants can absorb it in greater proportion than others. For instance, Italian rye-grass will take up 2.33 times as much nitrogenized matter as meadow-grass. An unskillful experimenter, on the discovery of this fact, concluded that this excess was unassimilated nitrogen, or sewage pure and simple. But as it is impossible for either animal or vegetable organism to absorb organic materials without changes necessary to assimilation, such conclusions are not the result of competent knowledge of the subject. Albumen and ammonia, for instance, cannot pass through the vital processes without undergoing a radical change. The rye-grass, with its greater assimilating power, can dispose of an increased quantity of nitrogen and render it available and safe for animal nutrition. Rye-grass produces more meat and more milk than any other, because it contains more nitrogen, and leaves more sugar in the dried plant. Thousands of tons fertilized by sewage are now consumed by farm-animals in England with great relish and a marked preference over ordinary meadow-grasses. The ease with which cattle brought up on sewage-farms withstand epizootic attacks shows that their nutriment is not of such a character as to impair their vital energy. Dr. C. cites the Beddington farm of 500 acres, 480 of which are more or less under irrigation, and 280 acres constantly since 1860. The sewage of over 50,000 persons has been constantly supplied in all

seasons, and its effluent stream is received by the river Wandle, which bears it through several large estates, the proprietors of which, men of wealth and intelligence, would be quick to detect and prompt to remove any nuisance inflicted upon them, having on four different occasions enjoined the Croydon board of health from creating nuisances. But in the case of the effluent water of the Beddington farm they have found no grounds for complaint.

The farm belongs to the Croydon Board of Health, which has but limited financial means to make it efficient as a sewage-farm. The district of Croydon for many years has shown a clean bill of health, the larger portion of the people living in villages within half a mile of the farm, yet the death-rate is about $1\frac{1}{2}$ per cent, while the birth-rate is more than double. The death-rate might be lowered still further by proper sanitary measures, abating several local nuisances not connected with sewage, such as foul wells, cesspools, &c. Dr. Carpenter claims that the utilization of sewage at Beddington has improved the health of the district. Very little of typhoid fever or other blood-poisoning disease is noted. He does not consider the effluent water as potable, but contends that it may be admitted to a water-course without any injury either to human residents or to the fish in the waters. The commissioners in charge of rivers allow any water to go into a running stream which does not contain more than two parts by weight of organic carbon, or thirty parts of organic nitrogen, in each 100,000 parts of water. The effluent water of Beddington, by careful analysis, falls within these official limits, and is even more pure than that which is supplied from the Thames for the people of London to drink. Beddington farm, with very inefficient management, returns a gross product of £20 per acre, being mostly grass. It has greatly cheapened both milk and meat in the local markets.

Dr. Voelker, while questioning some of Dr. Carpenter's theories, and insisting that organic matter must be reduced to the mineral condition before it can be perfectly assimilable by vegetation, confirms his statements of the Beddington sewage-farm from personal inspection. Sewage grass is richer in nitrogen than ordinary grass, but it is also more watery. It is very useful for milch-cows. Dr. Carpenter rejoined that the rye-grass on the Beddington farm was mixed with other kinds of food correcting its watery tendencies, and that this was the reason of the superior character of the milk produced.

AN ENGLISH SEWAGE-FARM.—Lord Warwick's farm of 400 acres receives the whole sewage of the borough of Leamington, with that of the suburban parishes of Milverton and Lillington, amounting on the whole to a million gallons per day. The soil is a rich loam, overlying a gravelly subsoil. The sewage is pumped through an iron main, $2\frac{1}{4}$ miles long, to a height of 132 feet above the farm, which insures its easy distribution. Eight hydrants regulate the flow and terra-cotta pipes carry the liquid to different fields, where it is distributed by trenches, which are dammed at different points by movable sluices. This arrangement has been in operation for five years, yet no complaint of nuisance has yet been heard. Lord Warwick pays £450 per annum for the material, and his contract was to run thirty years from the beginning. The borough pays the expense of pumping. The sewage is applied to almost all kinds of crops. The soil is generally well saturated before seeding. Great care is exercised to prevent the liquid from coming in contact with green leaves, which, in such case, become blackened and destroyed. The effluent water after examination at several points was pronounced by the health authorities remarkably pure, being especially free from fungoid

growths. The works originally cost £23,057. The annual installment of interest is £1,563.15, which is met by the boroughs of Leamington and the parishes of Milverton and Lillington, in proportion to their ratable value. The working expenses amounted last year to £1,046, less the £450 paid by Lord Warwick.

MILK TRANSMITS INFECTION.—The Sanitary Record (English) states that at Jarrow 34 cases of typhoid fever suddenly broke out in a limited district, in twenty different families, the cases being mostly confined to children. The houses, with two exceptions, were clean and well supplied with pure water. It was discovered that all the families received their milk from the same farm, which was at once visited. Six of the farmer's family were down with the fever. The water used in the dairy was from a well close to a cesspit, and evidently contaminated by soakage, as it became putrid in two days after drawing from the well. The dairy was also used as a wash-house and the linen of the sick persons of the family were washed in it. The person who milked the cows was in constant attendance upon the sick. The nuisance was promptly detected by the health-officer and immediately abated.

BRITISH IMPORTS OF BREADSTUFFS.—The official report of exports and imports of the United Kingdom during 1874 and 1875, gives the following figures in regard to the importation of breadstuffs:

	Quantities.		Values.	
	1874.	1875.	1874.	1875.
Wheat:				
Russia.....cwt.....	5,714,488	9,995,295	£3,180,723	£5,153,132
Denmark.....do.....	167,286	493,599	103,956	270,984
Germany.....do.....	3,053,680	5,615,984	2,017,623	3,149,174
France.....do.....	300,299	1,296,920	163,835	698,752
Austrian territories.....do.....	2,814	18,564	1,932	10,013
Turkey, including Moldavia and Wallachia.....do.....	659,676	1,308,137	364,082	608,402
Egypt.....do.....	293,880	2,093,853	172,242	1,028,122
United States.....do.....	23,048,552	23,463,910	14,178,791	12,400,875
Chili.....do.....	1,925,334	900,880	1,180,455	506,898
British North America.....do.....	3,807,174	3,604,610	2,238,167	1,966,994
Other countries.....do.....	2,506,277	2,994,641	1,599,256	1,625,624
Total wheat.....do.....	41,479,460	51,786,393	25,201,062	27,418,970
Barley.....do.....	11,379,736	11,055,916	5,266,096	4,630,654
Oats.....do.....	11,396,010	12,445,483	5,118,785	5,407,928
Maize.....do.....	17,683,212	20,420,292	7,484,178	8,112,158
Total cereal grains.....do.....	81,938,418	95,708,084	43,070,121	45,569,710
Wheat-meal and flour:				
Germany.....do.....	751,366	796,301	706,039	643,447
France.....do.....	659,568	1,752,079	606,457	1,381,394
United States.....do.....	3,290,235	2,273,846	2,915,752	1,734,272
British America.....do.....	389,355	358,756	332,096	267,864
Other countries.....do.....	1,139,084	867,697	1,149,476	801,190
Total wheat-meal and flour.....do.....	6,229,608	6,048,679	5,709,820	4,828,167
Corn-meal.....do.....	8,511	7,494	14,405	12,130
Total values of cereal imports.....do.....			48,794,346	50,410,007

CROP ACREAGE AND LIVE STOCK IN GREAT BRITAIN.—The British official returns show that in the island of Great Britain, in 1875, the total acreage in crops, bare fallow, and grass was 31,417,212 acres, showing an increase of 150,593 over 1874. England increased her area from 24,008,368 acres to 24,113,171; Wales from 2,678,730 to 2,696,143; Scotland from 4,579,821 to 4,607,898. The total under grain-crops was 9,451,650, an increase of 20,160. Of this total 7,528,843 were in England, an increase of 23,467; Wales fell off from 516,001 to 512,178; Scot-

land reports 1,410,929, an increase of only 516 acres. Wheat lost ground to the extent of 287,819 acres, the whole island having, in 1875, 3,342,481 acres. England had 3,128,547 acres, a loss of 262,893 acres; Wales 111,797, a loss of 6,072; Scotland, 102,137, a loss of 18,854. The acreage in barley and bere increased from 2,287,987 to 2,509,701; in England from 1,889,722 to 2,090,423; in Wales from 152,425 to 154,444; in Scotland from 245,840 to 264,834. The oats acreage increased from 2,596,384 to 2,664,009; in England from 1,356,739 to 1,421,951; in Wales from 235,621 to 237,170; in Scotland from 1,004,024 to 1,004,888. The rye acreage was 54,903, an increase of 12,325; in England 43,544, an increase of 6,896; in Wales 1,593, an increase of 26; in Scotland 9,766, an increase of 753. The acreage in beans rose from 559,044 to 564,181; England reporting 533,455, an increase of 7,894; Wales 3,398, a decrease of 363; Scotland 27,328, a decrease of 1,394. The acreage in pease increased 5,828 acres, being 316,375 in 1875, of which England had 310,623, Wales 3,776, and Scotland 1,976; Wales decreased and the other two increased.

The total acreage under green crops was 3,664,104, an increase of 82,834, England reporting 2,848,470, Wales 131,085, and Scotland 684,549; England increased and the others decreased. Of these so-called green crops 522,653 were in potatoes, an increase of 2,223, England having a total of 320,477, Wales 44,505, and Scotland 157,671; England increased and the others decreased. Turnips and swedes increased from 2,133,336 to 2,142,698, England having 1,569,049, Wales 70,326, and Scotland 503,323. Mangels rose from 322,614 to 361,615, of which 352,196 were in England, 7,261 in Wales, and 2,158 in Scotland. Carrots increased 1,009, being 14,936 in 1875, of which 13,591 were in England, 361 in Wales, and 984 in Scotland. Cabbage, kohlrabi, and rape occupied 189,733, an increase of 20,448; 183,402 in England, 1,237 in Wales, and 5,094 in Scotland. Lucern, vetches, and other green crops, not including clover or grass, aggregated 432,469 acres, an increase of 10,791; England 409,755, Wales 7,395, Scotland 15,319.

Of miscellaneous crops, 6,751 acres were in flax, a decline of 2,643—England 6,547, Wales 54, Scotland 150. England grew 69,203 acres of hops, against 65,799 in 1874; neither Wales nor Scotland report anything of this crop in 1875. The bare fallow-lands declined from 660,206 to 557,947—England 515,154, Wales 25,917, Scotland 16,876.

Clover, sainfoin, and grasses under rotation, occupied 4,354,071 acres, an increase of 13,329, nearly half of which were mown for hay; England reports 2,608,106, Wales 360,596, and Scotland 1,385,369. Permanent pastures, meadow or grass, not broken up in rotation, not including heath or mountain land, occupied 13,313,486 acres, an increase of 245,474, about one-third being mown for hay. England had 10,537,148 acres, Wales 1,666,313, and Scotland 1,110,025.

Of farm-animals, the total number of horses on the island was 1,340,129, an increase of 28,390, over one-third being unbroken animals and breeding-mares, and the remainder used. England reports 1,031,776, Wales 124,711, Scotland 183,642. Horned cattle declined from 6,125,491 to 6,012,824. Of these, 2,253,241 were milch-cows, a decrease of 20,556. England had 4,218,470 cattle and 1,595,296 milch-cows; Wales 651,274 cattle and 261,082 cows; Scotland 1,143,080 cattle and 398,863 cows. The total number of sheep was 29,166,139, a decrease of 1,147,802; over a third were less than a year old. England reports 19,113,335, a decrease of 746,413; Wales 2,951,810, a decrease of 102,486; Scotland 7,100,994, a decline of 288,493. Of pigs, by which is meant all classes of swine, the number declined from 2,422,832 to 2,229,918—England 1,875,357,

losing 173,424; Wales 203,348, losing 10,406; Scotland 151,213, gaining 916.

The Isle of Man and the Channel Islands have under crops and in bare fallow and grass 122,721 acres, of which 30,982 were in grain-crops, of which 10,292 were in wheat, 7,158 in barley, or bere, 12,797 in oats, 120 in rye, 263 in beans, 358 in pease. The total acreage in green crops was 22,836, of which 8,949 were in potatoes, 9,775 in turnips and swedes, and 2,692 in vetches, lucern, &c. Of bare fallow there were reported 739 acres; 39,959 acres were in clover, &c., under rotation, about one-fourth being cut for hay; 28,205 acres in permanent pasture, &c. These islands in 1875 contained 9,562 horses, 37,963 cattle, (including 16,575 milch-cows,) 76,352 sheep, and 16,014 pigs.

PHOSPHATIC MINERAL FERTILIZERS.—In the Journal of the Royal Agricultural Society of England, for 1875, Dr. Augustus Voelcker, consulting chemist of the society, publishes a supplement to his article published in the volume of 1861, upon the chemical constitution of phosphatic minerals used as fertilizers. Since his former publication he notes an extraordinary development of the manufacture of artificial manures, a branch of production almost unknown thirty years ago, and the numerous discoveries of raw materials resulting from the increased demand for fertilizers. Coprolitic or phosphatic deposits have been discovered in various parts of England, France, Germany, Russia, Spain, Portugal, South Carolina, San Domingo, and several small uninhabited islands of the Caribbean Sea. A few selected analyses of these materials are given by Dr. Voelcker, indicating the practical drift of these discoveries in their influence upon agriculture.

French coprolites, mostly from the neighborhood of Boulogne, are hardly distinguishable except by actual analysis from the inferior nodules of Norfolk and Bedfordshire, in England. In the Boulogne coprolites the phosphate of lime averages between 40 and 46 per cent., of the whole, and the insoluble siliceous matter about 25 per cent., with considerable proportions of oxide of iron, alumina, and fluorine. A superior variety is found in the valley of the Rhone, near Bellegarde, and close to the Swiss frontier. One specimen showed upon analysis 54.79 per cent. and another 60.60 per cent. of tribasic phosphate of lime. Both samples were lighter colored than the Cambridge coprolites, softer, and more easily pulverized. Perhaps the most valuable French deposits are those of the Ardennes region, but the cost of transportation will probably prevent the export of any to England, except the Boulogne varieties near the coast.

Phosphatic nodules are in great quantities in the department of Koursk, Russia, and are very similar in external appearance to those of Bedfordshire. One sample showed nearly 49 per cent. of tribasic phosphate, and about 33 per cent. of insoluble siliceous matter, with considerable quantities of oxide of iron, fluoride of calcium, and a little carbonate of lime; it had a dark-brown color.

Of English phosphates analyses are given of specimens from Cambridgehire, showing from 56.32 per cent. to 63.60 per cent. of tribasic phosphate of lime, with insoluble siliceous matter from 7.77 to 10.10 per cent. A good sample from Bedfordshire shows 51.54 per cent. of the phosphate, 7.84 per cent. of carbonate of lime, and 20.81 per cent. of insoluble siliceous matter. Most of the Bedfordshire nodules are brown colored, and contain a great deal of oxide of iron. A beautiful specimen of fossil phosphatic wood, found in the Bedfordshire deposits, showed nearly 72 per cent. of the phosphate, with 4.19 per cent. of

insoluble siliceous matter; the woody structure was distinctly preserved, its organic matter having been replaced mainly by phosphate of lime.

At Cwmgyngen, in North Wales, phosphatic minerals have been discovered near the lead-bearing clay-slate districts of Llangynag, in the Llandeilo series of Silurian rocks. A specimen taken from a compact block weighing one cwt. showed 64.77 per cent. of tribasic phosphate, with 22.14 per cent. of insoluble siliceous matter. This, however, was remarkable; the per cent. of phosphate in four other specimens ranging from 50.08 to 58.68. Two other cargo-samples showed 40.75 per cent. and 28.68 per cent. The two last named are hardly worth transporting any distance. North Wales has an abundance of phosphatic shale, but not of a character very available for market.

Canadian phosphates show a high percentage, good cargoes averaging from 70 to 72 per cent., and cargoes of less than 65 per cent. are rarely shipped. The per centum of siliceous matter is very low, five analyses varying from less than 1 per cent. to 13.50 per cent. They are difficult, however, to pulverize, but are of easy manipulation in the manufacture of concentrated superphosphate. The transportation across the ocean is a heavy tax on this production.

Spanish and Portuguese phosphorites of a white or yellowish color, vary in hardness and in the proportion of phosphate. In Spain, they are often found in solid beds, alternating with limestone and quartz. The latter is frequently mixed largely with the phosphorites, but the former in small quantity. They belong to the class of fluoride apatites, the fluorine often amounting to 14 per cent. Four rich specimens showed from 76.17 to 86.14 per cent. of phosphate of lime. The insoluble siliceous matter varied from 2.75 to 15.41 per cent. The highest per cent. of phosphate found by Dr. Voelcker was nearly 89, but cargoes in England seldom yield over 72, and the majority from 60 to 65. Twelve recent cargo-samples ranged from 56.19 to 75.25; in soluble siliceous matter from 4.98 to 37.29. The better qualities ground fine and treated with sulphuric acid produce light-colored concentrated superphosphates. They find ready sale and higher prices for their phosphate than coprolites and mineral phosphates containing much oxide of iron or alumina. They retain their high proportion of soluble phosphate unaltered by keeping, whereas those made from materials strongly impregnated with oxide of iron and alumina are apt to precipitate a portion of this valuable element, and to reduce another portion to the insoluble state.

Extensive workings of mineral phosphate are formed in the Lahn Valley, in the duchy of Nassau. The mineral occurs in pockets imbedded in ferruginous clay, but in some places it forms compact masses of earthy fracture, and of a light-gray or yellow color. Again it appears as a conglomerate of broken pieces cemented with red or brown clay, and mixed with greenstone, manganese, and iron. Rarely it occurs in slates of shaly fracture or in crystalline masses. Its richest varieties are botryoidal in structure and nearly white or yellow. The latter are becoming scarce, and the exportation to England has been almost arrested by the depreciated quality of the product. Three rich specimens from Staffel showed from 79.01 to 88.54 per cent. of phosphate, with but slight proportions of siliceous matter. Three cargo-samples gave from 66.01 to 77.99 of phosphate, with insoluble siliceous matter ranging from 3.48 to 10.62. Color and other external characters are a very imperfect test of the excellence of these minerals, which is made apparent only by chemical analysis. The foregoing, however, are above the average value of German or Nassau phosphates. Six cargo-samples are noted,

giving from 56.80 to 73.11 per cent. of phosphate. The less pure sorts are washed and sifted, yet a large proportion of the produce is too poor for profitable exportation, which requires at least 65 per cent.

Phosphates have also been found in the valley of the Lot, a tributary of the Garonne, and in various localities in the south of France. It is known as the Bordeaux phosphate, and occurs in pockets, varying greatly in appearance, texture, and commercial value. Sometimes it occurs in snow-white compact masses, moderately hard, and with an earthy fracture, but more frequently it is opal-like, grayish, of a waxy luster, and conchoidal fracture. Both kinds are rich in phosphoric acid as well as those occurring in botryoidal masses or stalactic forms. The more ordinary kinds are yellow or brown, dense and hard, but readily decomposed by sulphuric acid, and adapted to the manufacture of high-grade superphosphates. The first specimens brought to England ranged from 71 to 74 per cent. in phosphate; but poorer qualities, ranging from 58 to 65 per cent., have of late years, been shipped. Dr. Voelcker concludes that either the best qualities are showing signs of exhaustion or that the increasing demand prompts the shipment of inferior varieties. The high-quality samples contain from 73.78 to 77.52 per cent. of tribasic phosphate; medium quality, 63.35 to 69.16; inferior quality, 53.40 to 58.20.

The calcareous strata around Charleston, South Carolina, abound in phosphatic nodules quite similar to the coprolites of the London basin. These strata underlie the city of Charleston and extend between the Santee and Ashepoo Rivers, covering an irregular area of fifty-five to sixty miles. Within this basin are found deposits of fossil-bones and other animal remains, rich in the phosphate of lime, but the chief supply is found in nodules constituting from a third to a half of the strata in which they are embedded. They are generally found in detached deposits, at irregular intervals, along the streams. They are generally rough, irregular in form, water-worn, rounded, and light yellow or brown; they are somewhat cavernous and perforated by boring-shells. Fish-teeth and fragments of bones are frequently found with them. The land-deposits are lighter in color and softer than the river phosphates. Where embedded in and overlaid by sand it is readily separated by the action of water; where embedded in clay the tenacity of its surroundings renders it hard to disengage them. Later importations into England are better cleansed than previous ones. The following analyses illustrate the characters of land and river phosphates respectively:

Land phosphates.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Moisture	7.40	2.29	10.30	3.98	8.01	6.59	7.69
Water of combination						1.09	1.34
Phosphoric acid *	26.50	24.29	22.06	25.47	23.93	24.80	23.35
Lime	37.20	38.71	37.24	40.11	36.75	38.84	36.41
Oxide of iron and alumina, magnesia, carbonic acid, &c	16.27	17.28	15.45	18.82	16.88	17.01	16.54
Insoluble siliceous matter	12.63	17.43	14.95	11.62	14.43	11.67	14.67
	100.00	100.00	100.00	100.00	100.00	100.00	100.00
* Equal to tribasic phosphate of lime	57.85	53.02	48.16	55.60	52.24	54.14	50.93

It is probable that the low per cent. of phosphate in the above cargo specimens is due to the excess of water in the cargo, or to failure to wash it with sufficient care from adherent sand.

River phosphates.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Moisture, water of combination, and loss upon ignition.....	4.07	1.56	2.57	2.64	1.86	2.89	2.58
Phosphoric acid *.....	28.44	26.89	27.11	26.97	26.89	27.44	25.31
Lime.....	45.07	42.28	42.79	43.54	42.43	42.45	39.37
Magnesia, carbonic acid, oxide of iron, alumina, &c.....	15.16	18.47	17.54	17.57	17.39	17.80	16.19
Insoluble siliceous matter.....	7.26	10.80	9.99	10.28	11.43	9.42	16.55
	100.00	100.00	100.00	100.00	100.00	100.00	100.00
* Equal to tribasic phosphate of lime.....	62.09	58.70	59.18	58.87	58.70	59.90	55.25

The rivers belong to the State, and hence their underlying deposits can only be worked with consent of the legislature. Two companies have been incorporated for the working of this class of phosphates, upon which the State treasury receives a royalty of \$1 per ton. The production of phosphates has been several years in operation, the first export of 6 tons being in 1867, and to American ports, from Charleston and Beaufort. The export rose, in 1868, to 11,862 tons, of which 208 were to foreign ports; in 1869 to 28,271 tons, 3,760 tons being shipments to foreign ports; in 1870 to 53,571 tons, 13,652 tons to foreign ports; 1871, 64,792 tons, of which 42,923 tons were to foreign ports; 1872, 47,623 tons, of which 29,682 tons were for foreign trade. The total export up to that time was 206,305 tons, of which 90,225 tons were sent abroad. The foreign export had greatly surpassed the domestic export.

From the small uninhabited island of Sombbrero, of the Leeward group, in the Caribbean Sea, a valuable rock-phosphate has for several years been imported into England, but, as the supply is growing small, it is feared that the accessible deposits have been mostly exhausted. The rock is now worked beneath sea-level, and at great expense, while the number of dangerous coral-reefs forbid the close approach of ships to land, rendering the shipment of the rock very difficult at all times, and impossible during the stormy season, from September to January. Four cargoes imported into England during 1874 showed from 69.20 to 71.65 per cent. of phosphate, and 12.68 to 16.64 per cent. of carbonate of lime, with an average of less than 1 per cent. of insoluble siliceous matter. It is light colored, somewhat porous, and easily pulverized. It contains but little alumina or oxide of iron, and its increasing proportion of carbonate of lime seems to indicate that it is mined closer to the underlying coral-rock. It is very likely that the deposits hitherto worked are approaching exhaustion.

Another uninhabited island in the Caribbean Sea, Navassa, seventy-two miles east of Jamaica, surrounded by coral-reefs, and hence of difficult approach, supplies a mineral phosphate of reddish-brown color from the numerous cavities in its coral frame-work. It consists mostly of globular grains of phosphate of lime cemented into hard masses, and contaminated largely with oxide of iron and alumina. Its composition varies considerably. The lime in composition is insufficient to absorb all the phosphoric and carbonic acids, and hence a portion is united with oxide of iron or alumina. These elements always lower the commercial value of the mineral, inasmuch as the superphosphate made from it is poorer in character. The following detailed analyses of specimens of this mineral are given :

Navassa phosphates.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.
Moisture, water of composition, and loss in heating.	11.37	12.65	12.08	12.08	10.90	13.99	12.55	9.35	10.53
Phosphoric acid *.....	31.18	28.47	31.15	30.21	31.08	30.04	31.90	31.85	29.60
Lime.....	37.70	34.07	38.58	35.32	36.54	35.99	36.09	37.91	31.72
Magnesia, carbonic acid, oxide of iron, alumina, &c.	16.83	18.53	15.57	19.65	17.78	17.04	16.91	17.99	25.45
Insoluble siliceous matter...	2.92	6.28	2.62	2.74	3.70	2.94	2.55	2.90	2.70
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
* Equal to tribasic phosphate of lime.	68.07	62.15	68.01	65.94	67.85	65.58	69.64	69.53	64.62

The carbonate of lime in the first three specimens amounts to over five per cent.

Rock-phosphates of quite variable character are also found in St. Martin, a small island of the Windward group. They are mingled with inferior materials, requiring care and labor to eliminate. The percentage of phosphate of lime in eight analyses ranged from 36.39 to 80.64, and of carbonate of lime from 6.57 to 46.81. It is remarkable that the latter element was almost in inverse proportion to the former. Those specimens of low percentage of phosphate are practically useless and unsalable.

Aruba, one of the Leeward Caribbean islands, belonging to Holland, has been occupied for gold-mining since 1824. The mining company have recently obtained a concession to work the newly-discovered phosphatic minerals of the island. These are compact; hard, stone-like masses of rock, of light-brown or yellowish color, streaked with chocolate bands, and are frequently interlaced with calc-spar. These phosphates will probably prove a better investment than the gold-mining of the island, as they contain from 63 to 76 per cent. of phosphate of lime, with variable quantities of the carbonate.

Redonda, another Caribbean islet, yields a peculiar phosphate, once mistaken for phosphate of lime, but now known to consist, principally, of the hydrated phosphate of alumina with varying proportions of oxide of iron and insoluble siliceous matter. It is utilized for the production of alum, and the impure phosphoric acid extracted is incorporated with salts of ammonia and other fertilizing materials, to make artificial manures. After treatment with sulphuric acid it is also used to precipitate and clarify town sewage, for which it is a very effective agent. Four analyses of this material showed from 42.35 to 84.09 per cent. of phosphate of lime, though in most samples there is little or no lime in composition.

The phosphate of Alta Vela, an islet near Hayti, is harder and lighter colored than that of Redonda; three analyses gave from 43.81 to 67.37 per cent. of phosphate.

After giving in detail the specific characters of these different phosphatic deposits, Dr. Voelcker presents some conclusions of general interest and value. He says that none of the varieties described are of any great value unless treated with sulphuric acid. Some German phosphates of low quality have been usefully applied after simple pulverization in the neighborhood of their extraction, like marl, at the rate of about a ton per acre; but as a rule phosphates are useful only in the manufacture of superphosphates, in which the aim of the process is to render the phosphate soluble. Soluble phosphate of lime is a specific

compound, and is as valuable when derived from mineral deposits as from bones. Insoluble phosphate has little value, though bone-dust is available as plant-food.

The commercial value of phosphatic minerals depends almost entirely upon the percentage of phosphate of lime easily accessible by inexpensive processes. Some of these minerals contain ingredients which largely absorb the sulphuric acid with which it is treated. Carbonate of lime is especially greedy of this element, and when present in large proportions detracts greatly from its value. A small percentage, however, is rather beneficial than otherwise, as the carbonic acid set free in escaping through the mass renders it more porous and bulky, thus improving its mechanical condition as a manure. Oxide of iron and alumina detract from the value of the deposit in proportion to their percentage. Fluoride of calcium affects their commercial value, as also do the porosity or hardness of the mass and the ease or difficulty with which it can be pulverized.

MARKET-PRICES OF FARM-PRODUCTS

FOR DECEMBER, 1875, AND JANUARY, 1876.

The following quotations represent, as nearly as practicable, the state of the market at the beginning of each month.

Articles.	December.	January.
NEW YORK.		
Flour, superfine State and western... per barrel..	\$4 75 to \$5 00	\$4 25 to \$4 50
extra State.....do.....	5 10 to 5 90	4 80 to 5 90
extra to choice western.....do.....	5 10 to 9 00	4 80 to 9 00
common to fair southern extras.do.....	5 20 to 6 60	4 80 to 6 40
good to choice southern extras.do.....	6 65 to 8 75	6 50 to 8 75
Wheat, No. 1 spring.....per bushel..	1 35 to 1 39	1 29 to 1 33
No. 2 spring.....do.....	1 24 to 1 28	1 23 to 1 25
winter, red, western.....do.....	1 15 to 1 40	1 16 to 1 45
winter, amber, western.....do.....	1 15 to 1 40	1 16 to 1 45
winter, white, western.....do.....	1 35 to 1 48	1 32 to 1 50
Corn.....do.....	71 to 76	66 to 70
Oats.....do.....	41 to 51	41 to 50
Rye.....do.....	87 to —	87 to 95
Barley.....do.....	87 to 1 18	85 to 1 20
Hay, baled, first quality.....per ton..	18 00 to 22 00	21 00 to 23 00
baled, second quality.....do.....	14 00 to 15 00	16 00 to —
Beef, mess.....per barrel..	11 50 to —	11 00 to 11 50
extra mess.....do.....	12 50 to —	12 00 to 12 50
Pork, mess.....per barrel..	21 50 to 22 50	— to 20 75
extra prime.....do.....	16 00 to 16 50	15 50 to —
prime mess.....do.....	20 00 to 21 50	19 50 to —
Lard.....per pound..	12 to 12½	12¾ to 13½
Butter, western.....do.....	18 to 34	17 to 34
State dairy.....do.....	23 to 36	23 to 35
Cheese, State factory.....do.....	7½ to 13½	7 to 13½
western factory.....do.....	6 to 12½	6 to 12½
Sugar, fair to prime refining.....do.....	8 to 8½	8 to 8½
Cotton, ordinary to good ordinary.....do.....	11 to 12¾	10½ to 11¾
low middling to good middli'g.do.....	12¾ to 13¾	12¾ to 14
Tobacco, lugs.....do.....	7 to 9	7 to 9
leaf.....do.....	9½ to 13	9½ to 15½

Market-prices of farm products—Continued.

Articles.	December.	January.
NEW YORK—Continued.		
Wool, American XXX and picklock, per pound	\$0 48 to \$0 57	\$0 48 to \$0 57
American X and XX	40 to 48	40 to 48
American combing	50 to 62	50 to 62
pulled	20 to 47	20 to 47
California, spring clip	20 to 33	18 to 33
California, fall clip	17 to 25	15 to 25
BOSTON.		
Flour, western superfine, spring...per barrel..	4 50 to 4 75	4 00 to 4 50
common spring extras	5 25 to 5 75	4 75 to 5 50
good to fancy n'hwest'n spring..do.....	5 75 to 8 75	5 25 to 9 25
good to fancy western winter..do.....	6 50 to 8 75	6 00 to 9 00
southern family	7 50 to 9 00	6 50 to 9 00
Wheat	per bushel..	1 00 to 1 50
Corn	74 to 80	65 to 68
Oats	41 to 55	42 to 54
Rye	95 to 1 00	95 to 1 00
Barley	90 to 1 30	90 to 1 30
Hay, eastern and northern	per ton..	15 00 to 21 00
Beef, mess	per barrel..	12 00 to 12 50
extra mess	11 00 to 12 00	13 00 to 13 50
family	16 50 to 17 00	16 50 to 17 00
Pork, prime	15 50 to 16 50	15 00 to 15 50
mess	22 50 to 23 00	21 50 to 21 75
Lard	per pound..	13½ to 14
Butter, New York and Vermont	22 to 34	22 to 32
western	15 to 33	17 to 33
Cheese, New York and Vermont factory do.....	10½ to 13	10 to 13
western factory	8 to 13	10 to 12½
Sugar, fair to good refining	8½ to 8½	8 to 8½
Cotton, ordinary to good ordinary	11 to 12½	10 to 12
low middling to good middling..do.....	13 to 14	13 to 14½
Wool, Ohio and Pennsylvania	42½ to 50	45 to 53
Michigan	to 45	42 to 45
other western	42 to 56	41 to 45
pulled	15 to 56	40 to 55
combing fleece	40 to 64	55 to 65
California	15 to 35	15 to 36
PHILADELPHIA.		
Flour, superfine	per barrel..	4 25 to 4 75
Pennsylvania extra to choice	4 75 to 6 50	4 50 to 6 50
western extra to choice	6 00 to 6 50	5 50 to 6 37½
Wheat, white	per bushel..	1 45 to 1 52
amber	to 1 41	to 1 40
red	1 20 to 1 40	1 00 to 1 38
Rye	86 to 89	88 to 90
Barley	70 to 1 12	70 to 1 35
Corn	74 to 76	56 to 68
Oats	35 to 50	43 to 50
Hay, baled, prime	per ton..	22 00 to 24 00
baled, common to fair shipping..do.....	20 00 to 22 00	20 00 to 22 00
Beef, western mess	per barrel..	7 00 to 9 00
extra mess	8 00 to 9 00	8 00 to 9 00
Warthman's city family	16 00 to 17 50	16 00 to 17 50
Pork, mess	22 50 to 23 00	21 00 to 22 00
prime mess	19 75 to 20 00	19 50 to 20 00
prime	17 00 to 17 50	17 00 to 17 50
Lard	per pound..	13 to 16
Butter, choice Middle States	29 to 40	27 to 38
choice western	28 to 31	27 to 31

Market-prices of farm-products—Continued.

Articles.	December.	January.
PHILADELPHIA—Continued.		
Cheese, New York factory.....per pound..	\$0 12 to \$0 14	\$0 6½ to \$0 13¼
Ohio factory.....do.....	10 to 13½	5 to 13
Sugar, fair to good refining.....do.....	8½ to 8½	8 to 8½
Cotton, ordinary to good ordinary.....do.....	10½ to 12½	10 to 12½
low middling to good middling.....do.....	13 to 14½	12½ to 14½
Wool, Ohio and Pennsylvania X to XXX.....per pound..	48 to 48½	45 to 52
other western.....do.....	42 to 48	42 to 48
tub-washed.....do.....	40 to 56	40 to 54
pulled.....do.....	37 to 60	26 to 64
combing.....do.....	46 to 66	46 to 66
BALTIMORE.		
Flour, superfine.....per barrel..	4 25 to 4 50	4 00 to 4 50
extra.....do.....	4 75 to 5 50	4 75 to 6 25
family and fancy.....do.....	5 25 to 8 75	7 00 to 8 75
Wheat, red.....per bushel..	1 10 to 1 43	1 15 to 1 38
amber.....do.....	1 45 to 1 50	1 47 to 1 55
white.....do.....	1 15 to 1 45	1 15 to 1 45
Rye.....do.....	75 to 85	75 to 85
Oats.....do.....	37 to 50	40 to 48
Corn.....do.....	57 to 71½	50 to 62½
Hay, Maryland and Pennsylvania.....per ton..	20 00 to 26 00	18 00 to 25 00
western.....do.....	to	19 00 to 21 00
Pork, mess.....per barrel..	19 50 to 22 50	21 50 to
extra.....do.....	16 75 to 17 00	16 75 to 17 00
Lard.....per pound..	13½ to 14	12¾ to 13½
Butter, western.....do.....	20 to 30	18 to 28
eastern.....do.....	20 to 35	18 to 35
Cheese, western factory.....do.....	12 to 13½	11½ to 16
eastern factory.....do.....	12 to 13½	12 to 13½
Sugar, fair to good refining.....do.....	8½ to 8½	8 to 8½
New Orleans grocery grades.....do.....	to	7½ to 9
Tobacco, lugs.....do.....	6½ to 9	6½ to 11
leaf, common to middling.....do.....	9 to 11	9 to 11
Cotton, ordinary to good ordinary.....do.....	to 12	9½ to 11½
low middling to good middling.....do.....	12¾ to	12½ to 13½
CINCINNATI.		
Flour, superfine.....per barrel..	4 00 to 4 25	3 75 to 4 00
extra.....do.....	4 50 to 5 00	4 25 to 4 75
family and fancy.....do.....	5 30 to 6 25	5 00 to 6 00
Wheat, winter, red.....per bushel..	1 15 to 1 45	1 15 to 1 33
hill, (amber).....do.....	to	to
white.....do.....	1 25 to 1 55	1 15 to 1 48
Rye.....do.....	55 to 80	55 to 79
Barley.....do.....	50 to 1 25	50 to 1 50
Corn.....do.....	47 to 65	45 to 47
Oats.....do.....	25 to 42	35 to 44
Hay, baled, No. 1.....per ton..	18 00 to	15 00 to 16 00
lower grades.....do.....	11 00 to 17 00	8 00 to 14 00
Pork, mess.....per barrel..	20 75 to 22 00	19 75 to 20 00
Lard.....per pound..	12½ to 15	12½ to 14½
Butter, choice.....do.....	27 to 28	25 to 28
prime.....do.....	25 to 26	24 to 25
Cheese, choice to prime factory.....do.....	12½ to 13	12 to 13
Sugar, New Orleans, fair to good.....do.....	8½ to	7 to
prime, to choice.....do.....	to	8½ to
Tobacco, lugs.....do.....	15 to 20	15 to 20
leaf.....do.....	28 to 30	28 to 30

Market-prices of farm-products—Continued.

Articles.	December.	January.
CINCINNATI—Continued.		
Cotton, ordinary to good ordinary, per pound..	\$0 10½ to \$0 11½	\$0 09½ to \$0 10½
low middling.....do.....	12 to 12½	12 to 13½
Wool, fleece, common to fine.....do.....	38 to 43	38 to 43
tub-washed.....do.....	43 to 48	43 to 48
unwashed, clothing.....do.....	25 to 30	25 to 30
combing.....do.....	37 to 38	34 to 38
pulled.....do.....	31 to 37	31 to 37
CHICAGO.		
Flour, choice winter extras.....per barrel..	6 50 to 7 50	_____ to _____
common to good winter extras.....do.....	4 75 to 5 50	_____ to _____
spring extras, common to good.....do.....	_____ to _____	4 00 to 4 75
choice spring extras.....do.....	5 25 to 5 75	5 00 to 5 25
patent spring.....do.....	6 50 to 7 50	6 50 to 7 25
spring superfines.....do.....	3 00 to 4 00	3 00 to 3 50
Wheat, No. 1 spring.....per bushel..	1 06½ to _____	1 05 to _____
No. 2 spring.....do.....	1 03 to 1 04	95½ to 95¾
No. 3 spring.....do.....	86 to 87½	78½ to 78¾
Rye, No. 2.....do.....	68 to _____	67 to 67½
Barley, No. 2.....do.....	86 to _____	79 to 80½
Corn No. 2.....do.....	47½ to 48½	45 to _____
Oats, No. 2.....do.....	30½ to 30¾	30 to 34
Hay, timothy.....per ton..	12 00 to 15 50	11 to 13 00
prairie.....do.....	7 00 to 10 50	8 50 to 9 50
Beef, mess.....per barrel..	9 75 to 10 00	9 50 to 10 00
extra mess.....do.....	10 75 to 11 00	10 50 to 11 00
Pork, mess.....do.....	19 37½ to 19 40	19 10 to _____
prime mess.....do.....	17 50 to 17 75	17 00 to _____
extra prime.....do.....	14 00 to 14 25	14 25 to _____
Lard.....per pound..	12½ to _____	12¾ to 12½
Butter, choice to fancy.....do.....	25 to 32	25 to 32
medium to good.....do.....	19 to 23	18 to 23
Cheese, good to prime factory.....do.....	11 to 13	12 to 13
Sugar, New Orleans, common to prime.....do.....	7½ to 8¾	7½ to 9
Wool, tub-washed.....do.....	44 to 52	44 to 52
fleece-washed.....do.....	38 to 44	39 to 43
unwashed.....do.....	25 to 33	25 to 33
pulled.....do.....	_____ to _____	33 to 36
SAINT LOUIS.		
Flour, winter, common to choice...per barrel..	5 00 to 6 75	5 00 to 7 00
spring.....do.....	_____ to _____	_____ to _____
Wheat, white winter.....per bushel..	1 10 to 1 20	1 00 to 1 30
red winter.....do.....	1 00 to 1 50	1 00 to 1 50
spring.....do.....	_____ to _____	_____ to _____
Corn.....do.....	35 to 47	35 to 44
Rye.....do.....	54 to 68	60 to 68
Barley.....do.....	40 to 1 15	80 to 1 30
Oats.....do.....	28 to 39	30 to 39
Hay, timothy.....per ton..	14 50 to 16 50	14 00 to 16 50
prairie.....do.....	8 00 to 10 00	8 00 to 10 00
Beef, mess.....per barrel..	14 00 to 14 50	14 00 to 14 50
Pork, mess.....do.....	21 60 to 21 75	19 50 to 20 50
Lard.....per pound..	12½ to 13	15 to 15½
Butter, prime to choice dairy.....do.....	28 to 30	28 to 30
country packed.....do.....	20 to 25	20 to 25
Cheese, Ohio factory.....do.....	13 to 14	13 to 14
New York factory.....do.....	13 to 14	13 to 14
Wool, tub-washed.....do.....	42 to 50	42 to 50
fleece-washed.....do.....	38 to 42	38 to 42
unwashed.....do.....	30 to 38	30 to 38

Market-prices of farm-products—Continued.

Articles.	December.		January.	
NEW ORLEANS.				
Flour, superfine	per barrel..	\$4 25 to —	\$3 80 to \$4 00	
extra	do.....	4 50 to \$5 25	4 50 to 5 25	
choice to fancy	do.....	5 62½ to 7 25	5 50 to 7 50	
Corn, white and yellow	per bushel..	54 to 60	54 to 56	
Oats	do.....	37 to 52	45 to 50	
Hay, choice	per ton..	24 to —	25 00 to —	
prime	do.....	20 00 to 22 00	18 00 to 22 00	
Beef, Kansas	per barrel..	— to —	12 00 to 12 25	
western	do.....	12 00 to 17 00	16 00 to 17 00	
Fulton market	per half barrel..	11 50 to —	11 50 to —	
Pork, mess.	per barrel..	22 50 to 23 25	20 50 to 21 75	
Lard	per pound..	13¼ to 14¾	12½ to 14¼	
Butter, choice Goshen	do.....	33 to 35	33 to 35	
choice western	do.....	22 to 25	25 to 28	
Cheese, choice western factory	do.....	13 to —	13 to 13½	
New York cream	do.....	14 to 15	14 to 15½	
Sugar, fair to fully fair	do.....	6½ to 7	6½ to 7	
prime to strictly prime	do.....	7¼ to 7¾	7½ to 7¾	
clarified, white and yellow	do.....	8¼ to 9	8½ to 9¾	
Cotton, ordinary to good ordinary	do.....	10¼ to 10¾	9½ to 10½	
low middling to good middling	do.....	11½ to 13½	11½ to 13½	
Tobacco, lugs	do.....	7 to 9	6 to 8	
low leaf to medium leaf	do.....	9½ to 14	9 to 14	
SAN FRANCISCO.				
Flour, superfine	per barrel..	4 50 to 5 00	4 00 to 5 00	
extra	do.....	5 25 to 5 50	5 25 to 5 50	
family and fancy	do.....	5 75 to 6 25	5 75 to 6 25	
Wheat, California	per cental..	1 75 to 1 95	1 75 to 2 00	
Oregon	do.....	1 75 to 1 95	1 75 to 1 95	
Barley	do.....	1 20 to 1 50	1 10 to 1 35	
Oats	do.....	1 65 to 2 05	1 85 to 2 05	
Corn	do.....	1 22½ to 1 35	1 05 to 1 20	
Hay, State	per ton..	14 00 to 21 00	15 00 to 19 00	
Beef, mess	per barrel..	9 00 to 10 00	9 00 to 10 00	
family mess	per half-barrel..	8 00 to 10 00	8 00 to 10 00	
Pork, mess	per barrel..	23 50 to 24 00	22 00 to 23 00	
prime mess	do.....	17 50 to 18 00	17 50 to 18 00	
Lard	per pound..	13½ to 16	13½ to 16	
Butter, overland	do.....	18 to 25	18 to 25	
California	do.....	30 to 60	30 to 35	
Oregon	do.....	20 to 25	20 to 25	
Cheese	do.....	12½ to 15	12½ to 15	
Wool, native	do.....	10 to 15	10 to 15	
California	do.....	15 to 25	15 to 18	
Oregon	do.....	20 to 25	18 to 20	

LIVE-STOCK MARKETS.

NEW YORK.				
Cattle, extra beeves	per cental..	\$12 75 to \$13 50	\$12 25 to \$12 75	
good to prime	do.....	11 50 to 12 50	10 75 to 12 00	
common to fair	do.....	8 50 to 11 25	7 75 to 10 50	
Texas	do.....	7 50 to 10 50	7 00 to 8 50	
milch-cows	per head..	— to —	50 00 to 85 00	
veal calves	per cental..	7 50 to 10 00	7 00 to 10 00	
Sheep	do.....	4 50 to 6 50	5 00 to 7 50	
Swine	do.....	7 50 to —	— to —	

Live-stock markets—Continued.

Articles.	December.		January.	
PHILADELPHIA.				
Cattle, prime beeves.....per cental..	\$7 00	to \$7 62½	\$7 12½	to \$7 50
fair to good.....do.....	5 50	to 6 75	5 50	to 7 00
common.....do.....	4 00	to 5 50	3 50	to 5 25
Sheep.....do.....	4 50	to 6 00	4 50	to 8 00
Swine, corn-fed.....do.....	10 50	to 11 50	10 00	to 11 00
BALTIMORE.				
Cattle, best beeves.....per cental..	6 12	to 6 50	5 50	to 6 25
first quality.....do.....	5 12	to 6 12	4 50	to 5 50
medium or good quality.....do.....	4 25	to 5 75	3 50	to 4 50
ordinary.....do.....	3 00	to 4 25	3 00	to 3 50
general average of the market.....do.....	4 62	to —	4 25	to —
most of the sales.....do.....	4 00	to 5 25	3 75	to 4 75
milch-cows.....per head.....	—	to —	—	to —
Sheep.....per cental..	4 00	to 5 25	4 50	to 5 50
Swine.....do.....	8 75	to 10 00	9 00	to 10 00
CINCINNATI.				
Cattle, good to prime butchers'				
steers.....per cental..	4 75	to 5 25	4 50	to 5 50
fair to medium.....do.....	3 50	to 4 50	3 25	to 4 25
common.....do.....	2 50	to 3 25	2 00	to 3 00
milch-cows.....per head.....	25 00	to 50 00	—	to —
veal calves.....per cental..	—	to —	—	to —
Sheep.....do.....	3 25	to 5 50	3 00	to 6 00
Swine.....do.....	6 90	to 7 50	6 50	to 7 30
CHICAGO.				
Cattle, extra-graded steers.....per cental..	—	to 6 40	—	to —
choice beeves.....do.....	6 00	to —	5 25	to 5 75
good beeves.....do.....	4 00	to 5 40	4 50	to 5 10
medium.....do.....	3 00	to 3 75	4 00	to 4 50
inferior natives.....do.....	2 50	to 3 00	2 50	to 4 00
Texans.....do.....	2 75	to 4 00	2 50	to 3 75
Sheep.....do.....	3 00	to 4 50	4 25	to 5 50
Swine.....do.....	6 85	to 7 15	5 30	to 7 25
SAINT LOUIS.				
Cattle, good to choice native steers.....per cental..	5 75	to 6 12	5 75	to 6 25
common to fair natives.....do.....	3 50	to 4 00	3 50	to 4 50
inferior to common.....do.....	2 25	to 3 50	2 25	to 3 50
Texans, fair to choice.....do.....	2 40	to 4 25	2 40	to 4 50
Sheep.....do.....	2 75	to 4 90	2 75	to 4 90
Swine.....do.....	6 90	to 7 00	6 00	to 7 50
Horses, plugs.....per head.....	20 00	to 30 00	20 00	to 30 00
plain.....do.....	60 00	to 75 00	60 00	to 75 00
street-car.....do.....	75 00	to 125 00	75 00	to 125 00
heavy draught.....do.....	115 00	to 125 00	115 00	to 125 00
good drivers.....do.....	100 00	to 125 00	100 00	to 125 00
extra.....do.....	175 00	to 200 00	175 00	to 200 00
auction horses and ponies.....do.....	—	to —	20 00	to 85 00
Mules, 14 to 15 hands high.....do.....	80 00	to 130 00	80 00	to 130 00
15 to 16 hands high.....do.....	130 00	to 170 00	130 00	to 170 00
extra.....do.....	175 00	to 200 00	175 00	to 200 00
NEW ORLEANS.				
Cattle, Texas beeves, choice.....per head.....	40 00	to 46 00	40 00	to 46 00
first quality.....do.....	30 00	to 35 00	30 00	to 35 00
second quality.....do.....	20 00	to 25 00	20 00	to 25 00
western beeves.....per cental..	—	to —	4 00	to 6 50
milch-cows.....per head.....	40 00	to 90 00	40 00	to 90 00
Sheep.....do.....	2 00	to 6 00	2 00	to 6 00
Swine.....do.....	7 00	to 8 50	7 00	to 8 00

FOREIGN MARKETS.

WHEAT.—The old year in England closed with very mild, spring-like weather, but during the first week in January sharp frosts, with a temperature of 18° F., and followed by heavy snow-fall at various points, indicated the approach of abrupt changes and a class of conditions very trying to the short crop of winter-wheat already seeded, and gave rise to apprehensions as to the spring-planting. Yet the abundance of the supplies of foreign wheat were such as to prevent a rise in prices on account of the unfavorable indications of the coming crops. Prices with a poor crop range but 1s. 1d. per quarter higher than at the opening of 1874, with a very good crop. English farmers have but little inclination to overstock even the country-markets. Only a third of the last year's crop has been disposed of, and the trade in domestic wheat is very dull and intermittent. Frost at various points in France arrested the downward tendency of the Paris market, but the wheat and flour trade manifested no buoyancy. The same indications are reported at different points in Belgium, Holland, and Germany, but the general discontent of wheat-growers with current rates still resists the pressure for lower prices. As Saint Petersburg and Odessa were both closed by frost, shipments from Russia could not be expected for some weeks. A sudden advance upon prices at Adelaide, in Australia, with an unexpected difficulty in obtaining wholesale qualities, indicated that the supply from that quarter would be below expectations.

The sales of English wheat during the first week in January amounted to 34,557 quarters at 45s. 3d., against 37,921 quarters at 44s. 3d. the same week last year. The London averages were 46s. on 677 quarters. The imports into the United Kingdom during the last week of December, 1875, were 1,290,368 cwt. Monday, January 3, opened in Mark Lane upon small supplies of English wheat, with moderate arrivals of foreign. The fresh samples of Essex and Kent were in short supply, and mostly in very poor condition; their value was quite irregular, and difficult to state. Essex and Kent, white, were quoted at 48s. to 55s. per quarter; ditto, red, 42s. to 50s.; Norfolk, Lincolnshire, and Yorkshire, 41s. to 50s.; Dantzic, 52s. to 57s.; Königsberg, 49s. to 54s.; Rostock, 47s. to 50s.; Silesian, red, 46s. to 48s.; ditto, white, 51s.; Pomeranian, Mecklenburg, and Uckermark, red, 46s. to 49s.; Gbirka, 45s. to 47s.; Russian, hard, 42s. to 45s.; Saxonska, 46s. to 50s.; Danish and Holstein, red, 46s. to 49s.; American, 45s. to 49s.; Chilian white, 51s.; California, 53s.; Australian, 52s. to 56s.

At Liverpool, British white brought 10s. to 10s. 4d. per cential; ditto, red, 9s. 6d. to 9s. 10d.; Canadian white, 10s. to 10s. 4d.; American white, 9s. 11d. to 10s. 6d.; ditto, red winter, 8s. 9d. to 10s. 6d.; No. 1, Minnesota, 9s. 9d. to 10s. 2d.; spring No. 1, 9s. 6d. to 10s.; spring No. 2, 8s. 10d. to 9s. 6d.; French, 9s. 6d. to 9s. 9d.; Bombay, 9s. to 10s.; Kur-rachee, 8s. 3d. to 8s. 7d.; Egyptian, 7s. to 9s. 11d.; Californian, 10s. 4d. to 11s. 1d.; Oregon, 10s. 11d. to 11s. 1d.; Chilian, 10s. to 10s. 2d.; Australian, 11s. 3d.

In Paris, with fewer offers, the price of wheat remained unchanged. During the first week of January, 15 provincial markets were on the advance; 58 steady, and 35 on the decline. Prices ranged from 42s. to 47s. 5d. per quarter, choice samples realizing 50s.

FLOUR.—The imports into the United Kingdom during the last week in December amounted to 153,343 cwt. The following Monday, January 3, opened in Mark Lane upon fair arrivals of country flour and small

supplies of foreign, mostly in barrels indicating its American origin. The trade was dull and tending downward. The best town-households brought 43s. to 47s. per 280 pounds; best country-households, 37s. to 40s.; Norfolk and Suffolk, 30s. to 33s. In Liverpool, English and Irish superfines were quoted at 37s. to 39s. per 280 pounds; ditto, extra, 40s. to 42s.; French, 39s. to 46s. 6d.; Trieste, 50s. to 59s.; Chilian, 34s. to 36s.; Californian, 37s. 6d. to 38s. 6d.; American, western and extra State, 26s. to 28s. per barrel; Baltimore and Philadelphia, 26s. to 31s.; Ohio and extra, 28s. 6d. to 31s.; Canadian and extra, 27s. to 31s. 6d.

MAIZE.—In Mark Lane, with good supplies, prices were barely maintained, and the demand slack. White was quoted at 30s. to 32s. per quarter; yellow at 30s. to 31s. At Liverpool, American white brought 29s. to 32s. 6d. per 480 pounds; Galatz, 32s. 9d. to 33s.; Trieste, 32s. to 32s. 6d.; Dari, 26s. 3d. to 26s. 9d. At Paris the best red maize was quoted at 33s. per quarter.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

MARCH AND APRIL, 1876.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1876.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
STATISTICAL DIVISION,
Washington, April 18, 1876.

SIR: I submit herewith, for publication, a report of the condition of winter grain, and one upon the condition of farm animals at the opening of spring, and the diseases of animals during the past year; together with a paper on forestry, by the Commissioner, and various statistical facts and market records.

J. R. DODGE,
Statistician.

Hon. FRED'K WATTS,
Commissioner.

DIGEST OF APRIL RETURNS.

WINTER-WHEAT PROSPECTS.

In the more northern States, the autumn prospects of the crop have been, to some extent, blighted by freezing out, and otherwise winter-killing, owing to extraordinary absence of snow, accompanied by frequent alternations of freezing and thawing, in the earlier part of the winter; but in the latter days of March it was too early to ascertain the extent of the injury. In New York, Seneca, Livingston, Oneida, Washington, and Schuyler specify such injuries, while thirteen counties report a condition ranging from average to very promising, and others do not indicate the condition beyond the favorable fact that it was well covered with snow. Among the heavy winter-wheat counties, in which the condition is promising, are Niagara, Ontario, Erie, Onondaga, and Yates.

From Pennsylvania about two-thirds of the returns report more or less injury from winter-killing. The injury, of course, is greatest on clayey soils and others not well drained. The drilled grain stood the exposure better than that sown broadcast. In Indiana County, while the early sown stands well, the late sown does not promise half a crop; in Sullivan the condition is good on new ground, but 25 per cent. below average on old; in Adams, a heavy wheat county, many fields are almost ruined by alternate freezings and thawings; Washington, good on dry ground, but badly frozen out on wet; in Lancaster, producing over 2,000,000 bushels, or more than one-tenth of the crop of the State, the condition is good; in Fulton, better than for years. Among other counties producing large crops, which report from

average upward, are Lehigh, Delaware, Mercer, Juniata, Bedford, Northampton, and Dauphin. The winter-wheat States farther west, in the same range, have suffered in an equal, if not greater, degree, from the same causes. Among the more important counties in Ohio reporting excessive injury are Licking, 77 per cent. below average; Fayette, 50 per cent. below on clay land, and 10 below on black land; Clinton, 50 per cent. below; Crawford, nearly all killed in March; Champaign, more than 50 per cent. killed; Greene, 40 per cent. below; Clark, "not half a crop expected; many fields will be plowed up;" Pickaway, badly killed. Montgomery reports good condition on well-drained land, but nearly destroyed on undrained clayey soil; Wayne and Erie, good on upland, but badly killed on low clayey land; Huron and Noble, early sown, good. Hocking reports good condition; Tuscarawas, very good; Harrison, much above average; Miami, 20 per cent. above; Belmont, 40 per cent. above last year.

Half the returns from Indiana specify injuries from winter-killing, varying from an indefinite degree to 50 per cent. destroyed. Among these, Clinton, Stark, Martin, and Johnson place the condition 25 per cent. below average; Wabash and Madison, 37; Tipton, 40; Clay and Union, 50. In Huntington, while the drilled grain is 20 below, the broadcast is 60. In Steuben the condition of the early-sown is good, but of the late-sown bad; in Tippecanoe it is good on highly-cultivated land, but on other land "many fields are entirely killed." The condition was never better in Lawrence, is very fine in Floyd, and much above average in Posey.

In Illinois the reported injury is considerably less, something over two-thirds of the returns reporting a condition average or above. But from some of the heaviest counties the returns are quite unfavorable. Saint Clair reports that the condition is very bad; "it is safe to say that one-third is already lost;" in Randolph "winter-wheat looks no way encouraging;" in Montgomery "the crop looks anything but promising;" in Clinton 38 per cent. winter-killed, and in Vermillion only half a crop was sown, and that promises but 50 per cent. in yield. In Pike "it has not been winter-killed a particle," but owing to the fact that the autumn was very dry, and much of it sown very late, the condition is placed 20 per cent. below average. It is bad in Jackson for the same reason. On the other hand, in Jersey the condition is better than for years; fine in Macoupin and Sangamon, and in Monroe much better than anticipated in the fall and early winter. Among counties producing less quantities, Hardin, Pulaski, and Tazewell return the condition as splendid; Saline better than ever before; Menard, 120; Cook, 150.

Wisconsin and Iowa sow but little winter-wheat, and that has been very generally injured by winter-killing.

Michigan, having had more snow, reports a more favorable condition. Less than one-third of the returns are below average; over half, average or above; the others being uncertain, owing to the covering of snow. In Washtenaw the crop has done well, considering the open winter, and is improving; in Saint Joseph it is very bright and healthy; in Calhoun good, but in Oakland 10 per cent. below average.

In the remaining portion of the country the condition is favorable almost beyond precedent. The effects of extraordinary snow and cold, in the last half of March, in the South, where grain was unusually forward and tender, and of a severe drought in the Southwest, during the autumn, are almost the only drawbacks. Out of sixteen counties reporting on winter-wheat in Maryland, Howard alone returns a condition below average. Among fifty-six returns of winter-wheat from Virginia,

Craig and Caroline report that the condition is bad or below average; Warwick, that the crop is suffering from insects; Washington and Westmoreland, that it is backward; all others, unqualified good condition, and a large portion of extraordinary promise. Among the forty-five returns from North Carolina, Randolph reports 10 per cent. below average; Ashe, thin and weakly; Mitchell, badly killed; Surry, below average; Polk, yellow and frost-bitten; and Madison, much injured—all owing to snow and freezing between the 18th and 20th of March. In Stokes, the unusually forward crop was much injured by the same cause. All the other returns range between average and never better. The only exception to returns of good condition in South Carolina is Spartanburgh, in which the crop is "sorry." In Georgia, Decatur reports that the little planted is a failure; Stewart, Randolph, Wilkes, and Carroll, that the crop was injured by the snow and freeze in March; Terrell, that while the condition is good there is some complaint of insects. The other forty-seven counties report a good condition, without drawback, and many of them the best for years, or never better. Among the latter are Towns, Jefferson, Heard, Franklin, Cobb, Hall, Lincoln, Taliaferro, Taylor, Harris, Walker, and Lumpkin. The only return for winter-wheat in Florida is from Madison, in which the condition is better than ever before.

A majority of the returns from Alabama report the condition as of extraordinary promise, while only one (Franklin) reports below average. In Shelby, though the condition is the best for years, rust is reported in spots.

In Mississippi, the crop is unpromising in De Soto, and in Chickasaw, was made yellow and sickly by the snow and cold in March. All other returns are very favorable; Tishomingo and Newton 25, and Neshoba 15 per cent. above average; La Fayette and Lee, very promising; all others above average.

In Texas the only exceptions to returns altogether favorable are Gillespie, injured by grasshoppers and late frosts; Anderson, late planted, first rate, but early-planted injured by the mild, wet winter; and Gonzales, more or less rust. Bosque and Ellis report the best condition ever known, and Dallas, Collin, and Williamson, never better.

From Arkansas, Lawrence and Stone are the only returns below average.

In Tennessee, while many counties report the best condition for years, or never better, none are reported below average. The same is true in West Virginia, except that in three or four counties the previous good prospect was considerably injured by the severe freeze in March. The crop suffered from the same cause to a somewhat greater extent in Kentucky, but yet the general condition for the State was left much above average. Across the Mississippi, in Missouri and Kansas, a severe drought in autumn conspired with the freeze in March to materially reduce the condition in several counties; yet, out of fifty-five returns from Missouri, only seven fall below average; and only four out of thirty-five from Kansas. Not less than ten or twelve counties in the latter State report a condition never exceeded; in Barton, while, owing to the autumn drought, the general condition is 30 per cent. below average, the drilled is 50 per cent. better than the broad-cast. Other returns also note the superior condition of the drilled.

The returns from California are uniformly favorable, and a majority report that the condition is first rate. The same is true of Oregon.

RYE.

Winter-rye corresponds in condition very nearly with wheat, except that being more hardy it has suffered less from the open winter. All reports from New England are favorable, except that the crop has suffered some from winter killing in Hillsborough, New Hampshire, and is under average in Windham, Connecticut. In Berkshire, Massachusetts, a large amount was sown, and it promises a large yield. In Kent, Rhode Island, the condition is the best for five years.

Washington, badly winter-killed, is the only county in New York reporting below average. Mercer, New Jersey, is 25 per cent. below; all other returns, average or above.

From Pennsylvania, which produces nearly one-fourth of the rye grown in the country, a fuller abstract of returns is given:

F Westmoreland: Much "heaved out" by freezings and thawings. *Bucks*: 100. *Lehigh*: Good. *Lebanon*: 75—frozen out. *Northumberland*: Good on high ground; on low, frozen out. *Sullivan*: On new ground, good; on old, 50. *Mercer*: Above 100. *Juniata*: 100. *Indiana*: Early sown stands well, but the late sown does not promise half a crop; heaved out. *Elk*: Much above 100. *Columbia*: Much killed out; no snow. *Bradford*: 75. *Bedford*: Very good. *Wayne*: Much winter-killed. *Perry*: Injured by open winter. *Cumberland*: 100. *Clearfield*: Much killed out. *Adams*: Many fields almost ruined by alternate freezings and thawings. *Tioga*: Full 100. *Monroe*: Good. *Wyoming*: Good. *Northampton*: Above 100. *Clinton*: Injured by freezing and thawing. *Cambria*: Many fields will be plowed up. *Lawrence*: 100. *Lancaster*: Good. *Fullton*: 100. *Forest*: Under snow. *Dauphin*: 100. *Armstrong*: 100. *Pike*: Not promising, owing to want of snow, freezing, thawing, &c.

All returns from Maryland report good condition except Howard, 85. In Virginia, Caroline alone returns below average, while 36 counties return conditions ranging from average to the best ever known. There are but two exceptions to good condition in the returns from North Carolina, and one of them ascribed to the recent freeze. In the other Southern States, producing small quantities of rye, the condition is very generally promising.

From Tennessee, Grundy returns the condition as somewhat sickly, but all others are up to average, and a large portion much above. In West Virginia also the returns are uniformly favorable, except that considerable injury to the crop in several counties is ascribed to the freeze in March. Among full returns from Kentucky, the epithets "splendid," "best for years," and "never better," &c., are frequent. Kenton, thin on the ground; Pendleton, 25 per cent. below average, and Johnson, injured by the freeze in March. In Ohio, the injury from winter-killing is extensive, though not as great as in the wheat-crop. About half the returns report good condition, and many of the others partly good; the crop escaping injury on high or sandy land, and on well-drained, well-tilled lowland. Returns from Michigan all report good condition. The condition in Indiana corresponds with that in Ohio. In Illinois, as in the case of wheat, the injury from the open winter is much less, and the general condition is considerably above average.

But few returns of the condition of rye have been received from Wisconsin. Calumet reports the crop nearly all killed; Washington, badly killed; Adams, injured 30 to 50 per cent.; Rock, never better; others, average or good. About three-fourths of the returns from Iowa report good condition, the other fourth being more or less injured by winter-killing. From Missouri, the returns are still more favorable, more than four-fifths being average or above. In Kansas and Nebraska the promise is extraordinary, and from the Pacific slope the returns are favorable without exception.

CONDITION OF FARM-ANIMALS.

As a general rule cattle and sheep went into winter-quarters in good condition. Up to the 1st of March, in all sections of the country east of the Rocky Mountains, the winter was extraordinary for its mildness, diminished area and quantity of snow, and comparative freedom from hard storms. One consequence was, unusual exemption from diseases affecting farm-stock; another, a greatly diminished demand for stored feed. Owing to this latter, together with generous hay and corn crops, the localities have been very few and limited in extent in which suffering and emaciation from hunger could not be prevented by anything like reasonable precaution and care. In those sections which make no provisions for sheltering, and little or none for feeding stock in winter, the mildness of the weather and their consequent success in sufficiently providing for their own wants and comfort, resulted in conditions of health and vigor, which enabled them for the most part to withstand, without great loss or depreciation, the extraordinary cold and storms of March, which, east of the Pacific slope, was much harder on stock than either of the previous months. Hence unusually full county returns approach unanimity in reporting the condition of cattle and sheep throughout the country on the 1st of April as one of unprecedented health and thrift.

CATTLE.

The condition ranges from good up to remarkably good, best for years, &c., in all returns from New England except Franklin, Vermont, in which, though some stocks are looking remarkably well, yet the general condition is thought to be not quite average, owing to the unusually early season at which cattle came to the barn.

In full returns from the Middle States and Maryland the general range from good to never better, is but slightly qualified in seven counties. From New York, Niagara reports that the winter has been too warm to stimulate a vigorous appetite, and Livingston that poor shelter and changeable weather have brought the condition somewhat below average. In Lancaster and Pike, Pennsylvania, and in New Castle, Delaware, cattle are somewhat poor, owing to scarcity of feed.

Returns are equally favorable from the South Atlantic and Gulf States. Out of over sixty from Virginia, the only decidedly unfavorable one is from Scott, which reports that owing to the prevalence of "murrain and hollow-horn," many cattle have died and the survivors are very poor. They are reported as poor in Patrick and in Lunenburg, for want of care and feed. Healthy but poor in Clarke, owing to scarcity of long feed, and rough weather in March; very lean in Franklin; very thin in Northampton, owing to neglect; very poor in Greenville, that being the usual or average condition. On the other hand, the condition is much above average in Page, for the reason that farmers are learning the wisdom of properly feeding and sheltering stock in inclement weather. The condition is the best for many years in Craig, Middlesex, Southampton, King and Queen, and better than ever before in Spottsylvania and Mecklenburgh. In a large portion of the other returns the range is between very good and never better. Over four-fifths of the returns from North Carolina indicate a condition above, and a large portion much above, average, while three or four refer to cattle as thin, or looking rough, or bad, without assigning the cause, and only two report a bad condition from want of food and care. In South Car-

olina, Greenville reports cattle thin but healthy, and Clarendon very poor, owing to scarcity of feed; all other returns are favorable. In Georgia, out of between seventy and eighty returns, only five indicate an unfavorable condition, and that chiefly owing to the snowy and freezing weather in March. Jefferson alone returns a bad condition owing to a scarcity of feed. Effingham, Hull, Pierce, Montgomery, Mitchell, Baker, Coffee, Taylor, and McDuffie, report the best condition for many years. Dooly, Cobb, Dodge, Worth, and Walker, the best ever known. In Colquitt many of the cattle are fat enough for good beef. All returns from Florida show a condition much above average, and all from Alabama, except Perry and Franklin, in which it was much above until the 1st of March, and Etowah, in which, owing to scarce feed and the cold spring, cattle are poor. From Mississippi, all returns are favorable except Tunica, thin; De Soto, very poor; and Lee, bad, owing to the long winter. The favorable returns range from good, thrifty, never better, up to good beef. In Louisiana, Cameron alone returns a bad condition, owing to a too wet winter; while in Morehouse and Franklin the condition is the best for many years, and in Madison cattle are very fat.

In Texas, among fifty-seven returns, Cooke reports cattle as not in very good condition, and Blanco as very thin; all others indicate a good condition, and most of them one of extraordinary thrift. The winter was so mild and free from hard storms, that the grass on the range has continued to grow, leaving stock nothing to do but to eat and grow fat. In the following counties the condition reported ranges from the best for many years to better than ever before: Aransas, Bosque, Coryell, Dallas, Goliad, Matagorda, Falls, Collin, Hunt, Fannin, Hardin, Harrison, Kendall, Colorado, Williamson, Titus. Cattle are described as being fat enough for good beef in Henderson, Red River, McLennan, Hardin, Fannin, Williamson, Burleson, Waller, and Hays. Much above average, fine, excellent, flattering, splendid, &c., are descriptive epithets which abound in other returns.

In the interior Southern States the general condition is also remarkably good. The only exceptions reported are in Dorsey, Arkansas, "very bad;" Izard, below average, and Saint Francis, poor, owing to neglect; in Sullivan, Tennessee, "thin but healthy;" Pleasants, West Virginia, bad, owing to rain, sleet, and mud; and Nicholas, poor, owing to a short hay-crop; Daviess, Kentucky, rather poor, owing to the injury of crops by the great floods last summer; Mason, very low in flesh; Spencer, 10 per cent. below average; Scott, healthy but poor, owing to wet weather; Kenton, thin but healthy; and Lincoln, good but suffered from the severe weather in March.

In the States bordering the Ohio River on the north, rains in large measure took the place of snow in ordinary winters. As a consequence unsheltered stock suffered more than usual from exposure, and still worse from the mixing of feed with the cold mud in which they stood. Great injury to the hay-crop in these States by the unprecedented rains during the hay-season, operated as a further drawback upon the condition of stock. But notwithstanding, on the 1st of April the general condition was much above average. In between fifty and sixty returns from Ohio, not more than seven imply an average condition below fair or good, while a large portion range from very good to never better. In Indiana the general average is not quite so favorable, ten returns out of forty-eight describing the condition as something less than good. In Illinois, Edwards report a condition below average, "and in the flooded districts many have died;" White, 40 per cent. below, and "5 per cent. have

died for the want of food, and the end is not yet;" Richland, very poor, owing to wet and changeable weather. Two or three other returns imply a condition not quite up to average, while over fifty are favorable, many ranging between never better and better than ever.

From the Lake States, Michigan, Wisconsin, and Minnesota, there is not a single return in which the general good condition is qualified by a depreciative epithet, while that from Oakland, Michigan, "the best ever known—thriving all winter," has many equivalents. Returns are equally favorable from Missouri, Kansas, and Nebraska, except that in Missouri, Mississippi County reports cattle rather poor owing to the want of shelter and care; Lincoln, rather poor, owing to wet weather; and Nuckolls, Nebraska, not good, owing to the hard spring. In Iowa cattle have suffered from the same causes and in about the same degree as in Illinois, Indiana, and Ohio.

On the Pacific slope the rainy season was unusually long, but the winter was not otherwise severe. The weather being favorable to pasturage and comparatively free from hard storms, the general condition of cattle in California and Oregon is excellent. In California but three exceptions are reported. Cattle are reported as poor in San Bernardino; below average in San Joaquin, owing to the long wet winter and high price of feed; and in Trinity, while most of the cattle were driven down into the valley counties to be wintered, many among those left there have died, and the survivors are poor. In that locality the winter, though mild, was unusually stormy. Lane, Oregon, reports cattle poor, with some loss; but all other returns are favorable. In Umatilla cattle from the pastures are good beef.

Returns from Utah report the average condition of stock considerably lower than in any other section, owing to a long winter, deep snows, and a very severe March. In Beaver it is estimated that not less than 20 per cent. have died. Among seven returns from Colorado, Weld reports that cattle are 10 per cent. below average, owing to the fact that late rains kept grass green until killed by frost; and Conejos, that they are poor; the other five are favorable, El Paso reporting the condition equal to stall-fed beef.

SHEEP.

Throughout the country, sheep have not suffered from any other than the chronic diseases which are perpetuated in flocks from year to year, while the general conditions of weather and food-supply have been such as to contract and assuage, rather than extend and aggravate these. And since they usually share the lot of cattle in respect to exigencies of climate, feed, shelter, and care, in the different sections, they very nearly correspond with them in condition. Returns indicate an unusually large percentage of lambs saved. Several returns, particularly from Missouri, concur in ascribing a bad shedding of wool to feeding too freely with corn.

The only exceptions, of any consequence, to unqualified good condition, reported throughout the entire country, are the following: Vermont, Caledonia, below average, owing to wet weather. Pennsylvania, Sullivan, 20 per cent. below average; Washington, the winter too warm and wet for sheep; Dauphin, though healthy, below average. Maryland, Frederick, 5 per cent. below par, being permitted to run out in old fields. Virginia, Lancaster, look bad, owing to too much rain in March; Scott, very poor, with many deaths. North Carolina, Lincoln, looking bad; Buncombe, Henderson, and Stokes, thin. South Carolina, Clar-

endon, very poor, owing to scarce feed; Greenville, thin, but healthy. Georgia, Franklin, bad; Towns, Carroll, Taylor, and Wilkes, all good up to March, but much depreciated by extraordinary snow and cold in that month. Louisiana, Cameron, bad, owing to too wet weather. Texas, Palo Pinto, poor. Arkansas, Izard, below average. Tennessee, Johnson, 5 per cent. below. Kentucky, below average in Spencer, Boyd, Harrison, and Jessamine, owing to wet weather; in Grayson, except the sheltered, have not done well for the same cause. Ohio, owing to wet weather, mud, and damaged hay, thin, poor, or below average in Montgomery, Pickaway, Hudson, Belmont, Putnam, Marion, Washington, Ottawa, Licking, and Fayette. Clarke reports that the past winter was the hardest on sheep for many years; "flocks are thin and many will die;" Preble, that sheep are in fine condition where well sheltered and fed, "but haggard where left to shift for themselves." Michigan, Oakland, the housed in fine condition; but those left to roam in fields, very thin. Indiana, Clay, 10 per cent. below average; Vanderburgh, 5 per cent. below; Lawrence, rather bad, owing to bad condition when they went into winter-quarters; Knox, poor, and Orange, Wells, Hamilton, and Marion, below average, owing to excessive wet weather. Illinois, in Clay, flocks well cared for are in good condition, while others are poor and unhealthy; in Shelby the smaller flocks are above average; the larger below; in Edwards, "the worst condition ever seen, many flocks dying off and losing all the lambs, from continuous wet weather;" owing to the same cause, the condition is not quite average in Warren. In Des Moines, Iowa, sheep have not done well, owing to rain, snow, and mud; in Decatur, poor; in Lincoln, rather poor. In Butler, Kansas, sheep are fat, "except scabby flocks, which are poor and dying." In Furnas, Nebraska, all are in good condition, except the scabby. In San Joaquin, California, many sheep have been destroyed by sudden floods, and many sheep and lambs by severe storms; in Trinity they are poor; in Merced, the young are in good condition, but the old poor and scabby; in Contra Costa, the losses of sheep by starvation, and of lambs by protracted storms, are considerable; in San Bernardino, they are reported "terribly starved." In Utah, Salt Lake and Tooele report sheep poor. In Colorado, Weld, 10 per cent. below average, owing to late rains.

Thus, with unusually full returns, there is but one slight exception to reports of condition ranging from average upward to better than ever before, in New England; one in the Middle States; none in the Lake States; but one in the Gulf States; one in Arkansas; scarcely one in Kansas and Nebraska; none in Missouri and West Virginia, and very few in other States.

DISEASES OF FARM-ANIMALS.

Our April returns show that horses in all sections of the country have been afflicted with a modified form of the epizootic influenza, and that in the South and West swine have suffered from epizootic maladies to an extent which doubtless contributed largely to shorten the pork-crop of 1875. Cattle and sheep have, to a much smaller extent than usual, shown prevailing tendencies to disease. The mild winter, just closed, was more favorable to the outdoor wintering of stock, but even with this advantage our returns show serious losses in some counties from exposure and lack of food. In New England, where, from the necessity of circumstances, all branches of production are pursued with

strict reference to profit, no cases are reported of prevailing diseases, except such as depend upon general or climatic influences which no care can anticipate, as, for example, the epizootic influenza of horses. As our correspondent in Piscataquis, Me., judiciously observes, the farmers of that region have learned that to get the most profit out of stock, the animals must be kept in a thrifty condition. The natural difficulties in the way of the stock-raiser in New England, the long winters and the long and expensive feeding-seasons, are probably greater than in any other section. Yet here true economy has shown the economic value of care, shelter, and abundant food. In milder climates and on more productive soils, to the westward and southward, local diseases have prevailed and stock-farmers have been subjected to losses simply from lack of attention to these brute dependents. Our correspondence contains abundant evidence of the fact that disease has frequently been engendered, and in other cases fostered, by the foul condition of hog-pens and stables, and by the imperfect nutrition of animals turned out to face the storms of winter without shelter and with such scanty supplies of food as they were able to pick up in the field, forest, or public highway. Yet there are indications of improvement in this respect in sections of the country where the cruel and uneconomical methods of stock-keeping have been most prevalent.

The protection of farm-animals, especially sheep, from the ravages of dogs is a policy which has gained ground in those States where the nuisance has been most severely felt. Arkansas and Tennessee have both passed laws imposing taxes upon dogs, and providing for the destruction of those not registered. A bill of this character passed the Georgia house of representatives, but failed in the senate. Another step in the right direction will secure the stringent enforcement of these laws, and sheep-raisers in those sections begin to be hopeful of a profitable enterprise. Yet this necessary reform is still encountered by strong prejudices and by a low class of corrupt interests. One of our correspondents in a Southern State reports a conversation with a member of the State senate in which the senator acknowledged both the justice and necessity of the restrictive policy, but at the same time expressed the opinion that no politician could stand up before the storm of indignation which his vote in favor of a dog-law would produce. This shows that the reform must gain headway among the people before statesmen, even with the most enlightened views, will dare to inaugurate such legislation. Meanwhile the sheep and wool-producing interest is patiently suffering grievous losses. Pathetic complaints reach us of the destruction of valuable flocks in a single night by the onslaught of the curs. In many counties the nuisance amounts to a positive prohibition of sheep and wool raising. In the South, since the war, the evil has been greatly aggravated by the habit of keeping numerous dogs by freedmen. These animals, not being provided with food by their owners, are expected to provide for themselves, and unfortunately have recourse to the sheep-folds of the farmers. It is greatly to be regretted that this new class of citizens see proper to inaugurate their citizenship by a custom at war with the best interests of society; but the remedy will be found in bringing them to feel an intelligent interest in this matter by becoming sheep-raisers themselves. But the evil is by no means confined to this class. In the Middle States, and in some of their oldest counties, this nuisance is bitterly complained of. One correspondent in New York estimates that in his county there are twenty-five dogs to one sheep, and consequently sheep raising is practicable only within narrow limits. In the West, also, losses are very heavy in some counties, and public

sentiment is not yet sufficiently advanced to sustain a stringent and effective law against dogs. Yet the pressure of necessity must ultimately bring the public mind to recognize the necessity of such legislation. There is no doubt that it would result in a very great advantage both to agricultural and public interests.

DISEASES OF HORSES.

The epizootic influenza, which prevailed in the fall and winter of 1872-'73, re-appeared in the autumn of 1875 in nearly all the States; the symptoms, however, were mild, and the disease readily yielded to ordinary treatment. The mortality was also much less formidable than during the former visitation. In parts of the country where farm-horses are worked hard all winter, as in the lumbering districts, the disease left some permanent injuries in the form of heaves and other abnormal conditions. In some cases the symptoms were so like the common distemper as to be mistaken for it. Reports of this disease are so general and of such a stereotyped character, that it is not necessary to particularize. Of other diseases, New York reports in Suffolk County a paralysis of hind-quarters and inability to stand, followed by death in a few days. A similar affection is noted in Green, Wisconsin. In Washington, New York, a few cases of pneumonia occurred; the same report comes from Lawrence, Pennsylvania. The blind-staggers destroyed 200 horses in Cumberland, New Jersey, and 130 in Kent County, Delaware. It is reported also in Richland, South Carolina; in Santa Rosa, Florida; in Greene, Le Flore, and Choctaw, Mississippi; in Claiborne and Bossier, Louisiana; in Red River, Fannin, Wood, Cook, and Grayson, Texas; in Columbia, Lafayette, and Dorsey, Arkansas; in Callaway, Kentucky; in Cowley, Kansas. The *farcy* was prevalent in some parts of Colleton, South Carolina; most of the cases were fatal. Louisiana reports a few cases of *charbon* in Concordia and East Feliciana. Buffalo gnats were troublesome at two or three points in the Gulf States. Several counties report new diseases, but not of marked intensity or extent. In Lowndes, Mississippi, an affection of this character was somewhat serious. The symptoms were stupor, labored breathing, excessive urination, cough, fevered lungs, congestion of brain, and then death. In a few cases a dose of 60 grains of calomel, in a pint of linseed oil, was reported a successful cure, but no very reliable remedy was discovered. Our correspondent in Howard, Arkansas, distinguishes between blind-staggers and sleepy-staggers. In the latter the animal was taken with a chill, generally while eating, became stupid, scared at everything around, and died in from thirty-six to forty-eight hours. In Menominee, Michigan, another strange malady destroyed 4 per cent.; the marked symptoms were drooping and scouring. In several counties in the South and West horses died of neglect and starvation, rather than the forms of disease whose names were commonly reported in order to cover gross cruelty on the part of farmers. In Kern, California, horses were poisoned by the "loco" or crazy weed. Local horse-diseases of mild type are also noted in several counties as slight exceptions to general health.

DISEASES OF CATTLE.

Cattle-diseases during 1875 were limited in their range and intensity. The meteorological conditions were more favorable to the health of this class of farm-animals than in some previous years, and they enjoyed a greater degree of care and attention in some sections in which they

have hitherto been neglected. In the New England States, with the exception of a few imported cases of Texas fever in Berkshire, Massachusetts, all the counties reporting show an entire exemption from prevailing maladies. A few counties in the Middle States indicate local types of disease, but nothing like a general malady. In the South and West these local types crop out somewhat more numerous, but the Pacific coast reports but few diseases, and those of a mild type. The catalogue of maladies is, therefore, less extensive than usual.

TEXAS FEVER.—In Berkshire, Massachusetts, as above noted, in June, cattle imported into two or three towns from the West showed the presence of Texas fever, but confined to half a dozen herds. Sanitary measures, promptly taken, arrested the spread of the disease, while embargo and quarantine regulations stopped further importations. In Livingston, New York, 30 or 40 western cattle, all of one herd, died of this disease, but native stock were entirely unaffected. Some western cattle died in Washington, Pennsylvania. A disease resembling Texas fever in some points is noted in Burke, North Carolina, where, like other diseases, it is designated by the unmeaning term murrain. This disease annually makes its appearance from the East, traveling westward; it has prevailed in this region for fifteen years, but its severity is less marked than formerly. The disease is also noted in a few cases in Lorain, Ohio, and Scott, Illinois; in the last-named instance the animals were all imported.

ABORTION.—Our correspondent in Montgomery, New York, desires a scientific investigation into the growing tendency to abortion, especially among dairy-cows in that county. Investigations of other diseases are also called for by correspondents in different parts of the country. These gentlemen should understand that Congress has given the Department no facilities for such investigations. With our limited means we can only gather up the general facts, leaving it for scientific authorities to deduce from these facts the pathology and treatment of epizootic diseases. Abortion, to a greater or less extent, is reported in Wyoming, Rensselaer, Otsego, and Orange, and in Burlington, New Jersey. A strong tendency to this disaster is noted in Lehigh, Pennsylvania. A few cases occurred in Assumption, Louisiana, in Cook, Illinois, and in Stanislaus, California; in the last named about 3 per cent. of the pregnant cows slipped their calves. It is noticeable that this tendency is found almost entirely in localities near great markets; very few cases are observed in the rural districts, and most of cases reporting were in herds of dairy-cows. These general facts seem to indicate something in the management of this class of animals as the cause of this abnormal tendency. In Assumption, Louisiana, this malady was uniformly noted among cows affected with the jaundice, which is so common in that locality as to excite but little remark. The skin becomes very yellow, and the animal loses appetite and spirit. Blood-letting and a seton on the breast have been found of service in relieving the symptoms. This affection is probably the result of poor feeding and neglect; it is aggravated by a late and severe winter.

PLEURO-PNEUMONIA.—This disease was developed in several herds in Burlington, New Jersey. In Baltimore County, Maryland, it has prevailed for ten years, and was troublesome the last year, although it had been partially checked by sanitary measures. Our correspondent here has given close attention to this disease for several years, and has clearly indicated the abuses which have greatly aggravated, if they did not originally cause, this malady. Milk-dairymen still crowd their cows into filthy and ill-ventilated stables, and deprive them of the conditions

of healthy development. As soon as a cow shows signs of indisposition, as by refusing food, drying up her milk, &c., she is immediately slaughtered, and her carcass is sold in the shambles. Many animals in the incipient and some in the advanced stages of pleuro-pneumonia are surreptitiously butchered and marketed, though this nefarious business is accompanied by greater risk from exposure than formerly. As in former years it is observed that dairies using distillery slops are far more liable to this infection than others.

BLACK-FEVER OR BLACK-LEG.—A few deaths from "black-fever" among calves and yearlings occurred in Wayne, Pennsylvania. This is probably the same disease, with modifications, that is elsewhere called black-leg. The latter was very fatal in Highland, Virginia, where the first intimation of the disease was the death of the calf or yearling. A popular impression here is that bleeding would be an efficacious remedy for the disease if it could be discovered in time for treatment. For lack of sick animals to practice on, some farmers bleed all their calves every spring, a proceeding, to say the least, of very doubtful propriety. A few cases also occurred in Tazewell. It is also reported in Bosque, Texas; in Marion and Randolph, West Virginia; in Ogle, Illinois; in Renville, Dodge, Jackson, McLeod, and Taylor, Minnesota; in Humboldt, Clinton, Calhoun, Hancock, Harrison, Kossuth, and Emmett, Iowa; in Nodaway, Chariton, and Harrison, Missouri; in Jefferson, Lyon, Montgomery, Nemaha, Saline, Allen, Butler, and Washington, Kansas; and in Merrick, and Saunders, Nebraska. In most of these cases the disease was of limited range and showed no great virulence.

LUNG-FEVER.—A valuable herd of Alderney cows in Prince George, Maryland, was entirely ruined by what our correspondent calls lung-fever. It results from the sudden exposure to cold of cattle that have become habituated to close, warm stables. In that county it affects more or less all cows brought from dairy-stables in and around Baltimore. The premonitory symptoms are first a peculiar cough observed in no other disease, then the appetite declines, and as the disease advances, the cow stands by herself, head drooping, tongue protruding, saliva dropping from the mouth, bowels constipated, paying no attention to anything around her. Most cases terminate fatally. As facts indicate a contagious character of this disease, it is doubtful whether it should be distinguished from pleuro-pneumonia, which it so much resembles. Our correspondent having several sick cows, and not knowing what else to do, applied coal-oil to the skin over the lungs every day for a week. This caused the hair entirely to drop off, but after a second application the animals began to eat, and all but one recovered. A few cases of lung-fever occurred in Middlesex, Virginia.

DISTEMPER.—Our correspondent in Halifax, Virginia, defines the disease commonly known as distemper in that region as a high, inflammatory fever, of unusual prevalence in dry, hot summers, but of less than usual virulence during the cool, wet summer of 1875. It involves mainly the digestive apparatus, the liver, and the kidneys. It is found very difficult to start a cathartic action of the bowels. *Post-mortem* examination invariably shows the contents of the manifolds to be dry and hard. The disease is more or less contagious. Animals surviving the first attack are liable to subsequent ones, but mostly in a milder form. The difficulty of cure has directed attention more to prophylactics. Our correspondent suggests the following as usually relied on in his neighborhood. A bushel of purest red clay, a gallon of salt, four ounces of saltpeter, and two ounces of sulphur are all mixed together with water to the consistence of stiff mortar. This mixture is kept in the cattle troughs all the

summer and fall, and cattle soon learn to relish it. In Lunenburg the malady is called also red-water and murrain, and seems to be caused by indigestible food; losses here about five per cent. of all the animals in the county. In Pittsylvania the loss was about six per cent. It is reported also in Randolph, Yadkin, Surrey, and Transylvania, North Carolina.

MURRAIN.—Under this comprehensive but indefinite term is ranged, in popular nomenclature, a great variety of cattle-diseases, often of the most widely differing symptoms. It is used as the synonym of distemper, Texas fever, lung-fever, mad itch, milk-fever, and other maladies; but in the absence of a more definite term, it will be necessary to use it. In Macon, North Carolina, a disease called by this name developed a few sporadic cases, marked by a slight swelling under the throat, bruised appearance of the flesh, and secretions of yellow liquid under the skin after death. It put in a more or less dubious appearance in Dooly and Forsyth, Georgia; in Jackson and Colbert, Alabama; in Coahoma, Mississippi; in Saint Mary's, Louisiana; in Prairie, Arkansas; in Lincoln, Tennessee; in Johnson and Bath, Kentucky; in Tip-top, Indiana; in Dodge, Minnesota; and in McDonald, Missouri.

MAD ITCH.—In Coffee County, Tennessee, this disease is locally designated as rub-head. An irritation of the skin causes the animal to rub its head, neck, and shoulders against the ground or any upright object until the blood flows. Death supervenes in two days, if not sooner. It is also noted in Hancock, Illinois.

MISCELLANEOUS.—A few deaths in Adams, Pennsylvania, were attributed to an unknown disease, characterized by dullness, indisposition to eat, &c. In Patrick, Virginia, some milch-cows died of some disease not recognized. The hollow-horn, characterized by one of our correspondents as the synonym of hollow-belly, a disease resulting from defective nutrition, exposure, and neglect, is reported in several counties in the South and one or two in the West. In some cases death by actual starvation is reported. Our correspondent in one of the counties of North Carolina suggests that a portion of the cotton-seed thrown into the compost-heaps could be more judiciously used in feeding cattle and giving them a more respectable appearance. Milk-sickness or milk-fever is reported in Lucas, Georgia, and Lorain, Ohio. Some cattle died of blind-staggers in Perry, Mississippi. Charbon made its appearance, in a small way, in East Feliciana, Louisiana. In Woodruff, Arkansas, in Hancock, Illinois, in Henry and Clinton, Iowa, and in Holt, Missouri, cattle turned into corn-stalk fields without access to water were seriously affected, in many cases resulting in death. In a *post-mortem* examination in Clinton, Iowa, the third stomach was found "caked." The foot-and-mouth disease occasioned slight loss in Atchison, Missouri, but was more severe in Labette, Kansas. In the last-named county the symptoms included the swelling of feet, legs, and salivary glands. An ox far gone with the disease was restored by free drenching with Epsom salts, lard, and copperas. Undescribed maladies are also reported in Putnam and Mercer, Illinois, and in North Missouri.

DISEASES OF SHEEP.

Our April returns give fresh evidence that a little seasonable attention to this class of farm-animals, and an effective legal protection from the ravages of worthless dogs, would make this branch of agricultural production of immense profit to the parties engaged, as well as to the whole country. The diseases noted are mostly the result of neglect, starvation, and exposure. Yet it is gratifying to note the great im-

provement in the treatment of sheep in parts of the country where they have hitherto been left to shift for themselves. In the older parts of the country this is becoming better understood, and more careful treatment is producing its normal results.

FOOT-ROT.—This disease has affected 75 per cent. of the sheep in Rutland, Vermont, within the last ten years, causing during the last year a loss of 10 per cent. It was noted, also, in Ontario, New York, (where it is fast disappearing) Washington and Onondaga, in Salem and Burlington, New Jersey, where it was less severe than usual on account of the dry season, and also, in Delaware, Westmoreland, Washington, and Lawrence, Pennsylvania. Delaware and Maryland are entirely exempt from this and all other sheep-diseases, having a small number of sheep. Foot-rot is also reported in Buckingham, Virginia, in Mitchell, North Carolina, in Lawrence, Alabama, in Summit, Harrison, Wayne, Erie, Jackson, Champagne, Crawford, Delaware, Mahoning, Richland, and Wyandot, Ohio. Michigan, Indiana, and Wisconsin present a clean bill of health, showing neither this nor any other form of disease. Illinois reports foot-rot in Cook and De Witt; Iowa, in Marion; California, in San Luis Obispo.

ROT.—This disease is reported in Scott, Virginia; in Buncombe and Madison, North Carolina; in Taliaferro, Barlow, Towns, Oglethorpe, and Whitfield, Georgia; in Bossier, Louisiana; in Monroe, Tennessee; in Ritchie, West Virginia; in Jackson, Kentucky; in McDonald and Ozark, Missouri; Contra Costa, California. Our correspondent in Oglethorpe, Georgia, attributes the virulence of the disease in that region in part to the habit of keeping the flocks too long in the same field.

SCAB.—This malady was troublesome in Caledonia, Vermont; in Suffolk and Onondaga, New York; in Coffee and Lawrence, Alabama; in Perry, Mississippi; in Kendall, Burleson, Williamson, Bandera, Palo Pinto, De Witt, Gillespie, Collin, Karnes, Medina, and Austin, Texas; in Marion, Vermillion, and De Witt, Illinois; in McLeod and Isanti, Minnesota; in Marion, Iowa; in Atchison, Nodaway, Cass, Grundy, and Butler, Missouri; in Neosho, Allen, and Butler, Kansas; in Cumming, Platte, and Furnas, Nebraska; Colusa, Lake, Alameda, Napa, San Joaquin, Contra Costa, Kern, Mendocino, Merced, San Bernardino, Santa Barbara, Stanislaus, and Tuolumne, California; Umatilla, Wasco, Curry, Douglas, and Grant, Oregon.

GRUB IN THE HEAD.—Reported in Washington, New York; in Fairfax, Virginia; Marion, Mississippi; Williamson, Tennessee; Harrison, Kentucky; Coshocton, Ohio; Washington, Kansas; San Joaquin, California.

PAPER SKIN.—Reported in Baxter, Arkansas; Carroll and Harrison, Ohio.

MISCELLANEOUS.—Randolph, West Virginia, is the only county reporting fluke in the liver. The "pale disease" is noted in Beaver, Pennsylvania; blind-staggers in King William, Virginia, and in Iowa, Wisconsin. Some cutaneous and lung affections of mild type attracted passing notice in several counties, but are not of sufficient importance to classify.

The scab has been exterminated in a large number of counties by the dipping process. A Georgia correspondent attributes the health of sheep in his county to the smallness of the flocks and their free range. In Texas there is a law for the protection of native sheep from imported diseases, which sheepmen are very prompt to expose. In Bandera County an imported scabby flock, through the operation of this law, was

prevented from spreading the infection. In Muskingum, Ohio, sheep kept on dry feed did well, while those turned out to early grass suffered from disease. In Winona, Minnesota, a flock of 1,300 was wintered with the loss of only three venerable animals. In this case there was ample provision for food, shelter, and comfort of the flock.

DISEASES OF SWINE.

Statistical inquiry is, if possible, more embarrassed in classifying swine-diseases than those of cattle. Some of our correspondents feeling this difficulty have taken the trouble to particularize the symptoms of different forms of epizootic disease. If this were done more generally it would be much easier for the Department to present a coherent and intelligible view of these maladies, and of their influence upon the productive interests of agriculture. The record of 1875 shows a very formidable and general visitation of disease in different parts of the country. The most disastrous inflictions are found to be mostly west of the Allegheny Mountains, amounting in some cases to half or three-fourths of the entire stock of hogs in a county. In the New England States and New York the few losses by epizootic diseases included only imported animals, native stock being entirely excepted. In this region, however, as in several sections of the South and West, complaints of small litters of young pigs and of their premature death were so numerous as to cause apprehensions of a short crop of pork the coming year. It is well known that the western pork-packing enterprise of 1875, though operating with high prices and unusually stimulating the markets, fell short of the previous year's packing 686,091 hogs, with a decrease in the aggregate net weight of 105,183,436 pounds, and in the yield of lard of 17,364,027 pounds. Yet this diminished product trenched more closely than ever before known in many localities upon the stock-hogs of the country. The lack of a scientific or even an intelligible popular nomenclature renders it necessary to use the terms by which swine-diseases are generally known, though it is a matter of chronic complaint that these terms are notoriously inexact and that they include the most diverse types of disease.

A dubious mention of slight loss from some disease, called cholera, quinsy, thumps, &c., comes from Monroe County, New York. In New Jersey, Camden reports a loss of 2 per cent.; Burlington complains of large losses, and Warren of 100 deaths, or two-thirds of the cases. Cumberland, Pennsylvania, lost 50 per cent. of her hogs; Dauphin, 10 per cent.; Snyder, Lehigh, and Lycoming, 5 per cent. each; Cambria, Clinton, Adams, Perry, Beaver, Bedford, Northumberland, Westmoreland, and Washington report minor losses; in some cases the disease was complicated by the presence of kidney-worms. Delaware is exempt from all kinds of swine disease. In Maryland, Queen Anne reports an alarming prevalence of destructive symptoms; Baltimore lost 30 per cent., sweeping some entire herds, and yielding to no remedy; Worcester lost 10 per cent., and smaller losses were reported in Frederick, Talbot, Prince George's, Washington, Wicomico, and Cecil. A *post mortem* examination in Prince George's shows lesions of the windpipe, with a yellow frothy liquid in the stomach. In several localities in the State the disease was produced or its symptoms were greatly aggravated by the filthy pens in which the animals were confined. In Virginia, Middlesex and New Kent lost 20 per cent.; Washington and Chesterfield, 10 per cent. each; the disease was more or less destructive in Pennsylvania, Floyd, Halifax, Russell, Sussex, Patrick, Prince William, South-

ampton, Mecklenburgh, Campbell, Elizabeth City, Franklin, Frederick, Pulaski, Accomac, Fauquier, Prince George, Grayson, Henry, Northampton, Scott, and York. In most of these counties the disease was but little more than nominal. Our correspondent in Chesterfield recommends the following remedy: Boil the tops of small pines in water, and mix the decoction with swine-food, or use spirits of turpentine in the same way. Hogs affected should be kept in a dry place, and without access to water. In Washington the disease was believed to result from the presence of lice, which were driven off by applications of turpentine. Disease was generally found to originate from lack of care or cleanliness. In North Carolina, Gates lost one-half; Moore and Cumberland, one-third; Lenoir and Harnett, one-fourth; Warren, Clay, and Watauga, one-fifth, and Gaston, Randolph, Greene, Lincoln, Tyrrell, Buncombe, Haywood, Polk, and Wilkes, from 10 to 15 per cent.; smaller losses in Chatham, Iredell, Yancey, Bertie, Orange, Davidson, Hertford, Mitchell, Yadkin, Duplin, Nash, Person, Pitt, Rowan, Surry, Burke, Pamlico, Madison, Wilson, Alexander, Montgomery, Outlaw, Stokes, and Camden. Our correspondent in Pitt says that the symptoms were of a febrile nature—great thirst, surface-heat, distress, loss of appetite, &c.; sometimes diarrhea sets in, seeming to be nature's effort to throw off the disease. If the complaint does not yield at this stage, it generally assumes a typhoid character, accompanied by pneumonia. No remedy has been found effective; disease contagious. In several counties deaths from starvation were in some cases assigned to cholera. Defective nutrition, with lack of care and attention, were the causes of disease in many neighborhoods. In South Carolina, Georgetown reports very heavy loss, ranging from 25 per cent. to 75 per cent., which depleted the stock of domesticated hogs; those ranging the swamps suffered far less. Horry lost 45 per cent.; the characteristic symptoms here were stupor, loss of appetite, discharge from the bowels of watery yellow offensive matter, hair shedding and replaced by a gray or roan-colored hair. Orangeburgh lost nearly all; Clarendon, 10 per cent.; Edgefield, 75 per cent. of young pigs; smaller losses in Greenville, Barnwell, Lexington, Richland, Spartanburgh, and Chesterfield. In Georgia, losses of a fifth to a half of the stock in the county occurred in Dooly, Lumpkin, Thomas, Montgomery, Terrell, Worth, Early, Macon, Wilcox, Dodge, Screven, Hall, Towns, and Newton; smaller losses in Coffee, Liberty, Schley, Taliaferro, Troup, Union, Baker, Bartow, Carroll, Columbia, Gwinnett, Mitchell, Randolph, Calhoun, Floyd, Gordon, Hancock, Pierce, Clayton, Hart, Oglethorpe, Upson, Warren, Marion, Brooks, Decatur, Franklin, Jefferson, Chattooga, Forsyth, Pike, Sumter, and Wilkes. In Decatur, the prevailing symptoms were lack of appetite, drooping, emaciation, hollow flanks, vomiting, constipation, staggering gait, &c. Some attributed the disease to eating cotton-seed. In Florida, Leon lost 50 per cent.; the disease was also noted in Jackson. In Alabama, losses from 20 to 60 per cent. are reported in Crenshaw, Shelby, De Soto, Cleburne, Lawrence, and Bullock; smaller losses occurred in Lowndes, Jackson, Etowah, Calhoun, Colbert, Monroe, Perry, Butler, Greene, and Russel; Walker lost nearly all. In Mississippi, losses from 10 to 50 per cent. are noted in Greene, Marion, Rankin, Perry, Covington, Choctaw, and Claiborne; smaller losses in Pike, Chickasaw, Clark, Lowndes, and Lauderdale; Kemper, nearly all. In Lowndes, the symptoms were stupor, loss of appetite, hair rough and dead, cough, vomit of matter that looks like the contents of the bowels. Dry food for a change was found beneficial, and the following remedy was successful in some cases: Dissolve in water sufficient to soak a bushel of corn four ounces sulphate of

copper, one pound chloride of lime ; soak the corn and feed three times a week ; give charcoal, salt, and ashes freely. In Choctaw, cook-house slop mixed with copperas, sulphur, spirits turpentine, &c., was administered with good results. In Louisiana, Franklin lost 25 per cent. and Carroll 60 per cent. ; a few sporadic cases in Bossier and Jackson. Texas reports loss from 10 to 50 per cent. in Bowie, Blanco, Somerville, Fannin, Hunt, Anderson, Cherokee, Austin, and Grayson, with smaller losses in Dallas, Harrison, Wood, Cook, Ellis, Lamar, Rusk, and Upshur ; in Travis every case was fatal ; in Red River and Fannin, the destruction was fearful. In Fannin, the symptoms were stupor, loss of appetite, spasmodic muscular contraction, hard breathing, fevered skin, constipation, and just before death a froth oozing from the mouth ; death in great pain in twelve to thirty-six hours ; *post mortem* examination showed a watery fluid around the bowels. In Smith, a *post mortem* showed diseased lungs. In Arkansas, losses from 10 to 50 per cent. were noted in Ashley, Lawrence, Prairie, Crittenden, Arkansas, Dorsey, and Newton ; smaller losses in Saint Francis, Sharp, Woodruff, Independence, Scott, Howard, and Crawford. In Tennessee, losses from 10 to 30 per cent. occurred in Davidson, Sevier, Bledsoe, Sullivan, Bedford, Warren, Wayne, Johnson, Sumner, Van Buren, Union, Hancock, and Grainger ; smaller losses in Fentress, Monroe, Williamson, Lincoln, Truesdale, Washington, Loudon, Roane, Cannon, Houston, Obion, Rutherford, Decatur, Robertson, Tipton, Dickson, Giles, Carter, Rhea, Lauderdale, and Polk. In West Virginia, no county reports over 10 per cent. loss ; those noting the presence of the disease are, Hampshire, Lincoln, Putnam, Ritchie, Doddridge, Gilmer, Boone, Jefferson, and Mason ; in Mineral it was probably called pneumonia. Kentucky reports more severe losses, from 10 to 50 per cent. in Garrard, Oldham, Fayette, Christian, Marion, Metcalf, Scott, Grayson, Johnson, La Rue, Meade, Bath, Boyle, Jessamine, Lincoln, Warren, Harrison, Hopkins, Russell, and Breckenridge ; smaller losses in Cumberland, Fleming, Greenup, Daviess, Lewis, Mason, Spencer, Boone, Carroll, Pendleton, Pulaski, Shelby, and Butler. In Ohio, Fayette and Pike lost 30 per cent. ; smaller losses in Clark, Huron, Pickaway, Preble, Miami, Montgomery, Greene, Clinton, Erie, Marion, Champaign, Crawford, Delaware, Licking, Mahoning, Wyandot, and Butler. In Greene, a *post mortem* examination showed hundreds of white worms in the intestines, the largest three-quarters of an inch in length, and the smallest visible only under the microscope. A sick hog in a less advanced stage was killed, and the same parasites were found, but of smaller size. A weak solution of copperas saved animals in the first stages of the disease. In Huron, the glands of the throat were swollen, and death supervened within four days. In Pickaway, hogs following one herd of cattle were affected with nose-bleeding, of which many died ; hogs following other herds of cattle remained unaffected ; *post mortem* showed lungs full of bloody mucus. Some farms seem unable to raise healthy hogs. In Preble it was noted that hogs badly treated in the winter suffered most. In Michigan, small losses were reported in Branch, Saint Joseph, Berrien, Ottawa, and Oakland. In Indiana, losses from 10 to 50 per cent. occurred in Gibson, Posey, Union, Morgan, Knox, Orange, Warren, Crawford, Decatur, Warwick, Washington, Brown, Clay, Hamilton, Jennings, Johnson, Martin, Wells, Marion, and Pike ; smaller losses in Fayette, De Kalb, Rush, Lawrence, Putnam, Clinton, Franklin, Tipton, Shelby, Tippecanoe, Carroll, Dearborn, Madison, Whitley, Cass, Howard, Starke, Hendricks, Jasper, and Laporte. In Illinois, losses from 10 to 50 per cent. in Alexander, Clay, Edwards, Logan, Morgan, Tazewell, Macon, Sangamon, Scott, Clark, Jersey, Macou-

pin, Cass, Clinton, Ford, Franklin, Jasper, Menard, Monroe, Montgomery, Pike, Putnam, Stark, Shelby, White, De Witt, Grundy, Hancock, McLean, and Randolph; smaller losses in De Kalb, Hardin, Jackson, Mercer, Woodford, Lee, Saline, Bureau, Marion, Piatt, Vermillion, Warren, Jefferson, Mason, Pope, and Richland. In Wisconsin small losses reported in Juneau, Jackson, Iowa, and Crawford. Minnesota reports 10 per cent. loss in Taylor and 20 per cent. in Carver, with lighter losses in Todd and Shelby. Iowa reports losses in Adair, Hamilton, Iowa, Lucas, Union, Story, Appanoose, Clinton, Jackson, Polk, Franklin, Johnson, Louisa, Allamakee, Calhoun, Jasper, Jefferson, Jones, Muscatine, Scott, Adams, Des Moines, Guthrie, Harrison, Lee, Linn, Marion, Mills, Montgomery, Sac, Wayne, Dallas, Henry, Monona, O'Brien, and Tama. In some cases these losses amounted to half the stock in the county; they were greatly aggravated by starvation and exposure. In some cases quinsy was also present. In Missouri hog-maladies, variously designated as cholera, quinsy, and thumps, are reported in Atchison, Buchanan, Gasconade, Nodaway, Platte, Worth, Caldwell, Chariton, Howell, Jefferson, Pike, Putnam, Cass, Franklin, Harrison, La Fayette, Macon, Phelps, Ripley, Saint Genevieve, Shelby, Bates, Knox, Mississippi, Moniteau, Montgomery, Saint Charles, Saint Francis, Stoddard, Bollinger, Cole, De Kalb, Holt, Howard, New Madrid, Pemiscot, Ralls, Schuyler, Cape Girardeau, Dade, Livingston, Butler, Carroll, and Iron. In some cases the losses were more than half the hogs in the county. In Kansas the visitation was slight, including mostly imported hogs. Nebraska notes a small loss in Lancaster and Nemaha. Catarrhal affections are reported in Stanislaus, California, and blind-staggers in Clackamas, Oregon. Some cases of death in the Southern States are attributed to excessive feeding with cotton-seed. In Hillsdale, Michigan, a herd of sick hogs were cured by washing the fore legs and breast with soap-suds, thus opening the pores and enabling the skin to discharge the virus of the disease. In Shelby, Kentucky, the following remedy is recommended: 15 pounds each of copperas, madder, sulphur, and black antimony, mixed with 15 ounces each of bluestone and worm-seed, all well pulverized, and administered at the rate of a tablespoonful once a week in moistened meal or bran. A variety of prescriptions, more or less similar to those above given, are reported by correspondents, showing the prevailing ideas of medical treatment in different parts of the country. It seems, however, sufficiently evident that diseases are mostly the result of bad sanitary conditions.

WOOL-CLIP OF 1875.

On the 1st of April only one county in Maine, Lincoln, reports a balance of the clip of 1875 in the farmer's hands, estimated at 5 per cent. In Grafton and Hillsborough, New Hampshire, the remnant is estimated at 25 per cent.; in Cheshire 10 per cent.; in Sullivan 5 per cent.; in Vermont six counties range from 5 to 25 per cent.; in Connecticut, Litchfield holds 10 per cent. and New London 33 per cent.; in New York, thirteen counties range from 1 per cent. to 12½ per cent.; thirteen counties in Pennsylvania, from 3 to 30 per cent.; in Maryland, Wicomico had on hand 25 per cent. and Caroline 10 per cent.; in Virginia, ten counties reported from 1 to 25 per cent.; in North Carolina, thirteen counties varied from 1 to 50 per cent., the last named being Bertie; in South Carolina,

Lexington retained 33 per cent. and Spartanburgh 3 per cent.; in Georgia, Union, Hart, and Fayette had 50 per cent. over, Taylor 25 per cent., and six other counties from 3 to 10 per cent.; in Alabama, six counties had a surplus of 10 to 25 per cent.; in Mississippi, Tishemingo had 50 per cent., and Winston, Choctaw, and Chickasaw 25 per cent.; in Louisiana, East Feliciana still holds a third of her clip; Titus, Texas, has still half her fall clip, and DeWitt 5 per cent.; in Arkansas, Cross had not disposed of any part of her clip; Perry held half of hers, and five other counties from 5 to 20 per cent.; in Bedford and Dickson, Tennessee, half still remained, and eleven other counties held from 2 to 25 per cent.; in West Virginia, eleven counties held from 1 per cent. to $12\frac{1}{2}$ per cent.; in Kentucky, 8 counties retained from 5 to 25 per cent.; in Ohio, twenty-one counties still held from 2 to 25 per cent.; in Michigan, ten counties from 5 to 20 per cent.; in Indiana, sixteen counties from 5 to 20 per cent.; in Illinois, seven counties from 5 to 30 per cent.; in eleven counties from 2 to 10 per cent.; in Minnesota, Renville still held half her clip, and five other counties from 5 to 18 per cent.; in Iowa, Jones had still half on hand, and five other counties from 5 to 25 per cent.; in Missouri, fifteen counties from 5 to 33 per cent.; in Kansas, four counties from 10 to 33 per cent.; in Nebraska, Dawson still held a third; in California, Yuba and San Luis Obispo still held a third, and four other counties from 3 to 10 per cent. These are all the counties reported as retaining balances in the hands of the farmer, showing a very close marketing of the clip of 1875.

THE TOBACCO-CROP.

Our annual census of tobacco, in counties producing not less than 100,000 pounds, makes a large increase of production over the crop of 1874, which was a comparative failure, and in some sections a heavy increase of area in cultivation. The returns have not all been received, and the aggregate produced last year is, therefore, delayed until the publication of the annual.

An inspection of the tables will afford an indication of the ratio of increase. The increase is large in Pennsylvania and Maryland. In Virginia, Pittsylvania County returns 6,000,000 pounds against 4,200,000 last year, and Mecklenburgh 4,000,000 instead of 2,000,000. Several of the best tobacco counties in North Carolina report a large increase. Tennessee came nearer a total failure in 1874 than any other State, making the figures for 1875 appear very conspicuous. In Kentucky and Missouri there is also a large increase.

OUR CENSUS OF THE GREAT TOBACCO COUNTIES.

The Connecticut River crop in New Hampshire matured well, under the influence of a warm autumn, except from frosts. The Hampden County (Massachusetts) yield might be considered average in quality, with perhaps a smaller percentage than usual of prime wrapper-leaf, the result of the ravages of the cut-worm at the time of setting. Hartford, the center of the Connecticut supply, reports only medium quality, resulting from unfavorable weather for growing and curing. The crop of the Litchfield region was of low quality, from late setting and subsequent drought. The New York crop is not very heavy. Onondaga County reports 600,000 pounds, grown on 750 acres, of the best quality obtained in the past three years.

In York, Pennsylvania, the leaf is large in size and of fine texture, though much of it is subject to a blemish caused by intervals of hot sunshine in cloudy weather, causing the leaf to "fox." The crop is larger and finer than that of 1874. Except the "foxy" portion, it is equal to the stock of 1873, the finest ever produced in that region. Some of it was injured by being stripped in too damp a condition, making it too tender for wrappers. The price varies from 4 to 20 cents, the average being placed at 8 cents. The estimate for Lancaster County, 13,884,000 pounds, grown on 9,286 acres, shows that the interest is not declining in the heart of Pennsylvania. The crop is worth about \$2,500,000.

The quality of the tobacco of Calvert, Maryland, is decidedly better than that of the previous crop. Seasonable rains caused luxuriant growth and a fine texture of leaf. Good weather throughout the curing process produced a larger proportion of yellow and red qualities. The same causes, however, gave an unusual proportion of "ground-leaf," so that fully one sixth of the crop went to market in this form, and sold at very low prices. In Charles the quality is generally good, the leaf fine and silky, generally bright but very light from excess of rain in August, being forced up too rapidly to acquire body and weight. In Howard the season for planting and growth was propitious; in the later season growth was too rapid, producing a weaker leaf than usual. The Montgomery yield was of average quality. Our Prince George's correspondent writes of the vital importance of a revision of the inspection-laws, to give better satisfaction in sampling both to buyers and producers. The quality in this county is above average, the principal defect being the "firing" of the ground-leaves from excessive rains. In some cases the ground-leaves were a third of the crop, selling in the fall at 3 to 9 cents per pound. In Saint Mary's a good quality was obtained, a little light in proportion to bulk. The Frederick crop was an average in quality.

A large increase of area was made in Albemarle, Virginia, in consequence of the small crop and high prices of 1874, which was reduced somewhat by frost in April. The season was subsequently favorable to leaf-growth, and a large crop was obtained of light and thin tobacco, deficient in the essentials of a "good, heavy, rich article." A large proportion of the crop of Botetourt is characterized by our correspondent as nondescript, due to several causes: 1st, early summer drought; 2d, the ripening and housing season too wet; 3d, the colored people entered more largely into tobacco growing last year than ever before in this county, many of them not having suitable land, others without proper facilities to cultivate a crop, and others too indolent to give it that prompt and careful attention which is necessary to secure a good article. Our Brunswick correspondent is enthusiastic over the tobacco-lands of his vicinity, claiming the best shipping-tobacco in the United States—light-clay surface on red-clay subsoil. In Buckingham a wet summer reduced the average of quality. In Campbell injury was caused by early frost. In Caroline a fair quality was obtained, yet a large portion of the crop went to market in too damp a condition. The prevalent cause of injury, too much rain in the growing-season, rendered the Charlotte crop rather light. A medium grade was reached in Chesterfield; the best on good lands, well manured and thoroughly cultivated; the poorest injured by wet weather and green cutting. Early frosts in Floyd did not reduce the average of quality below medium. The heavier soils of Fluvanna, the river-bottoms, and heavy clays yielded a coarse article; the light soils produced a better grade. A large increase of product was realized. The quality of the product of Franklin was reduced in

consequence of the planting : and poor cultivation, in many instances. It was of light and chaffy quality in Goochland, from excess of wet weather, and light, also, in Hanover. An unusually favorable season for ripening and curing made an excellent crop in Henry. In Lunenburg the weather was unfavorable in August and also in December and January, and there was a lack of suitable barns and curing-houses for protection from the weather. There is a popular opinion here that the use of commercial fertilizers reduces the quality. The great number of small patches without facilities for curing causes a reduction of the average. An excellent quality was obtained in Mecklenburgh, especially on high lands, the lower situations being somewhat too wet in August. The weather was too wet in Montgomery and too dry in Nottoway. In Prince Edward the wet weather, at the usual period for cutting, continued, and made it necessary to cut much of it before full maturity. The quality of Danville tobacco is not quite up to the standard of last year, but is medium and the color good. In Powhatan the leaf was light from the excess of summer rains. Planters generally concede that the crop of 1875 is from five to ten times as great as in 1874, and that but for excessive rains it would have been a third larger still.

The effect of excessive moisture is seen very generally in the crop of North Carolina, which has more light and chaffy material in it than usual. This is especially noticed in Person, Alamance, Caswell, Granville, Orange, Stokes, Forsyth, and Surrey. It is about an average in Guilford. Still there is some rich, waxy stock of good color; a fair proportion of a comparatively bright article, but little that is strictly fine, yellow tobacco. In some cases tobacco wanting in wax has a desirable color. In Caswell there was considerable injury from the "spot" and "sore-shin," (rotting of the stock near the surface of the ground,) and less than half a crop was produced. Our correspondent in Alamance County regards the use of flues of brick or stone, covered with sheet-iron and making a circuit through the shed or barn, as less dangerous than the method of curing by coal. Wood is supplied from the outside, and the heat can easily be regulated. Sun-curing is deemed best for chewing-tobacco. He sends some remarks upon the cultivation and curing of fine yellow tobacco by Maj. Robert L. Ragland, of Halifax County, Virginia, an expert in the production of high-priced samples, from which the following extracts are made :

The "Yellow Oronoco" and "Silky Pryor" are the kinds best adapted to coal-curing, while gray soils, (and the fresher the better,) with dry, porous subsoil, are best adapted to the growth and maturity of yellow tobacco.

Plant in hills, instead of beds, as soon after the 10th of May as the plants and season will admit. Commence cultivation as soon as the plants begin to spread over the hills, whether grassy or not, and continue to stir the land with plows and hoes till the tobacco begins to come in top, using short singletrees, as the plants increase in size, to prevent breaking and bruising. When the plants are too large to admit the plow, use only hoes to keep down the grass and weeds.

To prevent depredations by the fly, use ground plaster, in which rags, saturated with kerosene-oil, have been laid for some hours, and cover the plants, if necessary, with the plaster thus prepared.

Wait till a considerable number of plants begin to button for seed before you commence to top; then these will ripen about the same time. Topping must be done according to the appearance and promise of each plant, strength of soil, and time the work is done. First topping for medium tobacco should be from ten to twelve leaves, rarely more; priming off lower leaves, neither too high nor too low, but just enough, so that when the plant ripens the lower leaves may be well off the ground.

Continue topping as the plants are large enough, observing, as the season advances, to top lower and lower, so as to bring in the late plants before frost.

The plow should not be used later than the 1st day of August, as plowing late keeps the tobacco green too long, and may cause it to ripen of a green color. The hoe should be relied on after that time to clean the crop.

After the tobacco begins to grain, that is, to ripen, neither plow nor hoe should be used, as it has been found best to sacrifice pounds to color.

The plants after being topped should be kept clear of worms; or, better still, kill the tobacco-fly with cobalt in the flowers of the "Jamestown weed,"* and the suckers should be pulled off before they grow too long. Mind, do not be in a hurry to cut your tobacco before *fully ripe*, and enough fully and uniformly ripe to fill a barn. Have your barns close, (log ones are best,) well daubed, and dry. Cut the tobacco of uniform size, color, and quality, putting about seven medium plants to an ordinary 4½-foot stick. Let the plants go from the cutter's hands over the stick in the hands of a holder, who will serve two cutters. When the stick is filled it should go directly, without touching the ground, on a wagon, to be carried, when loaded, (not too heavily,) to the barn. It will take from seven hundred to eight hundred sticks of tobacco to fill a barn 20 feet square, with five rooms, and four firing-tiers below joists, placing the sticks about 10 inches apart, the proper distance for medium tobacco. As soon as the barn is properly filled and the tobacco regulated on sticks and tiers, fires of coal or hickory wood should be built in the barn, four fires in a row under each room, thus giving twenty fires to a barn 20 feet square. If hickory wood is used, let it be sapling wood, cut about 2 feet long, and green, or partially dry. Next to coal, hickory furnishes the best yellowing-heat.

The first step in curing is called the STEAMING or YELLOWING process. Medium tobacco will require about thirty-six hours steaming, at about ninety degrees Fahr., to yellow sufficiently; but tobacco with more or less sap, larger or smaller, may require longer or shorter time to yellow. Here the judgment of the curer must be his guide. Inexperienced planters would do well to procure the services of an experienced curer, if they have tobacco suitable for coal-curing. The planter saves, in the enhanced value of his crop, many times the money paid to the curer; and, besides, by close observation, he may learn in one season to cure well himself. Theory alone, however good, and directions, however minute, will not do here; but it is *practice* that must qualify one to cure well.

The next step in curing yellow tobacco is called FIXING THE COLOR. When the tobacco is sufficiently yellowed, at ninety degrees Fahr., the best leaves of a uniform color, and the greener ones of a light pea-green color, it is time to advance the heat gradually but cautiously. Keep the heat from ninety to ninety-five degrees Fahr., say for about an hour, then run up from ninety-five degrees to one hundred degrees, keeping the heat between those figures for about *two hours*, observing to let the mercury descend a little every time after raising, before putting on more coal—coal only should be used now. This is done to prevent sweating the tobacco, a continuous heat operating more to do that than a fluctuating one, as described. Should the tobacco get into a sweat at this or any future stage, which is indicated by the leaf becoming damp and limber, as though partially scalded, raise the fires a little, and open the door; this creates a current of heated air that will soon dry out the leaf. The thermometer may fall even *ten degrees* here without injury to the color. It is advisable, however, that the tobacco be kept free from sweating, if possible. Next advance the heat, running from one hundred to one hundred and five for about *two hours*. When at one hundred and five degrees, you have arrived at the *most critical point* in the difficult process of curing bright tobacco. The condition and appearance of the tobacco must be the curer's guide. No one can successfully cure tobacco till he can distinguish the effects of too much or too little heat at this important stage. I will try to explain what is very plain to every experienced curer, but unknown to the beginner.

Too little heat in fixing color operates to stain the *face* side of the leaf of a dull Spanish-brown color, and is called *sponging*, and may be known to the novice by its effects being visible only on the *face side*; too much heat reddens the leaf, first in spots, visible on the edge of the leaf, redder than the former, and visible on *both sides* of the leaf. Now, to prevent sponging on the one hand and spotting on the other, is the aim of the experienced curer. Therefore, no definite time can be laid down to run from one hundred and five to one hundred and ten degrees. Sometimes one hour is sufficient; sometimes three is fast enough. The same may be said in running from one hundred and ten degrees to one hundred and twenty degrees. While it is usual to advance in this stage about five degrees every two hours for medium tobacco, the condition of the tobacco often indicates to the practiced eye the necessity for slower or faster movements. Remember not to advance over one hundred and ten degrees till the tails begin to curl up slightly at the ends.

Arrived at one hundred and twenty degrees, this is the *curing* process. The heat

* Dissolve an ounce of the cobalt of the shops in a pint and a half of water, and mix it with molasses or other sirup, bottle it, and drop it through a quill into the heart of the blossom. It should be done about sun-down, and the poisoned flowers pulled off next day; otherwise the plant will be destroyed. It has been found that this weed, so treated, planted around the edge of the tobacco-lot, and here and there through the patch, will prevent, to a great extent, the ravages of the tobacco-worm. All the planters, however, in one neighborhood must act together, and this can be arranged through the local agricultural club.

should remain at or near one hundred and twenty degrees till the leaf is cured, which takes from four to eight hours, according to circumstances. When the leaf appears cured, advance five degrees every hour up to one hundred and seventy degrees, and here remain till stalk and stem are cured. To run above one hundred and eighty degrees is to endanger scorching the tobacco, and perhaps burning both barn and tobacco. To recapitulate:

1st. Steaming or yellowing process.....	90 degrees for 36 hours.
2d. Fixing the color.....	90 to 95 degrees for 1 to 2 hours.
Fixing the color.....	95 to 100 " 2 "
Fixing the color.....	100 to 105 " 2 "
Fixing the color.....	105 to 110 " 1 to 3 "
Fixing the color.....	110 to 115 " 2 "
Fixing the color.....	115 to 120 " 2 "
3d. Curing of leaf.....	120 " 4 to 8 "
4th. Curing stalk and stem.....	120 to 170 " 5 deg. per hour.

and continue at one hundred and seventy degrees till stalk and stem are thoroughly cured.

After curing, as soon as the tobacco is sufficiently soft to move, it should be run up in the roof of the barn and crowded close. If warm, rainy, or damp seasons occur soon after, dry out the tobacco with coal-fires, remembering to commence with small fires, as when curing, and gradually raise them till the tobacco is well dried. It is important to attend strictly to this; for if your tobacco is cured yellow it will not remain so if, soon after curing, it is suffered to get in too "high order," that is, absorb too much moisture. When ready to strip, it should be assorted well, the several grades put together, making about three grades of leaf and two of lugs. Tie in neat bundles five or six leaves of "leaf" and eight to ten of "lugs." Place twenty-five bundles on the stick, and strike down as soon as stripped, unless in too high order. But it is not safe to permit tobacco thus struck down in winter-order to remain down longer than 1st of June. Watch it closely to preserve from injury. It is better to market in winter-order than to hang up in the barn to dry out and be re-ordered; for tobacco once barked down and then hung up in the barn again loses that sweet, mellow flavor so desirable, and never regains it when prized.

Pack neatly in tierces (half hogsheads making the best and most economical) to weigh from four hundred to five hundred pounds net. Take care that the tobacco be not pressed so as to stick together or be bruised, and let each tierce be filled with tobacco uniform in color, length, and quality.

"If at first you don't succeed,
Try, try again;"

and act out that motto. You will have the satisfaction ere long of earning success and reaping the reward of your perseverance in doubling and trebling your income from this crop.

The crop of Cuban tobacco grown in Gadsden County, Florida, is increasing in quantity. In 1870 the census reported 118,729 pounds. Last spring our reporter returned 200,000, and this spring 350,000 pounds for the crop of 1875, grown on 450 acres, an enlargement of 50 per cent. in the area planted. The price is not yet given; 200 boxes of 350 pounds have been sent to New York, but returns of sales have not been received. The quality is the best of any crop since 1865, attributed to the fact that experienced planters have resumed its cultivation. Our correspondent claims that the test of forty years' experience proves that deterioration is not produced in that soil and that climate, and expresses the opinion that Florida tobacco should supersede the Cuban in cigars.

The effect of wet weather is also seen in Tennessee in reducing the quality of this product; and a further reason adduced is the inexperience of a multitude of beginners in the business. Our Smith County correspondent remarks the increase of care in handling. Our correspondent in Robertson counsels the necessity of stamping or rolling, and "brushing" heavily the seed-bed after seeding, to secure the retention of moisture during the period of March and April winds. He forwards the following statement of Mr. C. C. Bell, a successful grower of his county:

To raise tobacco profitably the best lands should be selected. New lands, when well prepared and well cultivated, make a very good article; but old lands, well manured,

generally make our finest tobaccos. Among the favorite varieties of tobacco produced in our county are the Yellow and Blue, Little Yellow, Pryor Williams, and Beat All. All of which, if planted in good lands and well cultivated and properly cured, will make tobacco suited for wrappers and more especially adapted for the foreign markets that pay the best prices for American tobacco. Plant-beds are generally burned in the richest spots of woodland, with brush or wood, in the months of January, February, and March, and the plants are ready for transplanting by the 20th of May or 1st of June. Before the time arrives for transplanting, the lands intended to be planted should be plowed deep, well harrowed, and fully pulverized, after which small hills should be made about $3\frac{1}{2}$ feet apart each way, and after the plants have been set they should be well cultivated, never permitting the lands to get the least foul with weeds or grass; and another very important point is to keep off the worms and not allow them to eat the leaves full of holes. Tobacco should never be topped to more than ten leaves. Cut when fully ripe and carry it immediately to a tight barn, (never hang on a scaffold,) and fires should be started under the tobacco soon after it is hung in the barn, started and kept up slowly for the first day, after which it might be increased and should be kept up steadily until the tobacco is fully cured. After which it should be assorted, tied in small bands, and neatly bulked. Tobacco thus produced and cared for will always sell for twice the amount of such as is poorly cultivated, worm-cut, and badly cured.

The West Virginia crop cannot be considered average in quality. The injury from the wet and hot season was greater in some counties than in others.

The complaint of injury to quality is very general in Kentucky, the plants being submerged in June and July, and subsequently exposed to great heat, parching and cracking the earth, and "firing" the leaf, and resulting in an immature crop, deficient in gum and chaffy in texture. In some sections there was too much rain in August. There is not so much loss in the color as in other qualities. There is much tobacco that is "frenched." Bad quality is attributed to bad handling, in Fulton County. The leaf is short and the color dark in Pendleton. Medium or good quality is reported in Oldham, Metcalfe, and Livingston. Cutting and manufacturing is reported bright in Muhlenburgh County.

Wet weather had its influence in Ohio, and early frost caught a portion of it in immature condition. Along the Ohio River considerable areas were entirely destroyed by floods, and in the interior many fields were similarly destroyed. The color, as well as the texture of the leaf, suffered injury quite generally. The Warren County crop is represented as a total failure. In Noble, new land products are fine. A leaf of fair quality, though light, is reported in Morgan. In Adams County that grown on rolling land is fine, but the product of level lands is light and trashy. In Vinton there was much rain in the early part of the season; the later months were very favorable, the plant ripened well, the leaf was thick and retained its gum, and the crop is claimed to be the best ever raised there.

The crop of Indiana suffered from causes affecting tobacco elsewhere. "Frenching" was very common, and the cutting was necessarily done in many instances before maturity, greatly deteriorating the quality.

Quality is also lower in Illinois. In some localities increased attention has been paid to this crop, and the area greatly enlarged—in part, by new-comers from the Southern States.

A marked increase in the area planted in Missouri is indicated, as the tables will show. There is much complaint of injury by wet weather and subsequent heat, and frequent mention of "frenching," but less than in the States of the Ohio River. Inexperience in housing and curing has affected quality in Saint Charles, and the army-worm wrought some injury. Late planting, after the disappearance of grasshoppers, left the crop immature at the season for cutting in Ray County. In Franklin, the injury was only from drought and frost. In Chariton, quality is generally good; also, in Randolph a favorable season was enjoyed; and the product of Howard was very good." Our Howard

correspondent states that "the season was favorable for planting; a large portion of the crop was set early; it was remarkable throughout the growing period; no annoyance by worms, no 'ragged edges;' but little was frosted. The autumn was dry, and very favorable for taking care of the crop. These conditions caused quantity, quality, and color to be remarkably good. The season was so favorable that some portions of the crop was cured out-doors for want of house-room."

Tobacco-crop of 1875.

States and counties.	Pounds, census 1870.	Pounds estimated for 1875.	Number of acres in 1875.	Price per pound, 1875.	Value, 1875.
PENNSYLVANIA.					
York.....	527,808	1,275,000	850	Cents. 9	\$114,750
Lancaster.....	2,692,584	13,884,000	9,256	5.5	763,620
Total.....	3,220,392	15,159,000	10,106	5.7	878,370
MARYLAND.					
Calvert.....	3,158,200	3,350,000	5,550	7.5	251,250
Charles.....	2,102,739	2,100,000	3,000	7.5	157,500
Howard.....	182,980	150,000	250	10	15,000
Montgomery.....	630,000	800,000	1,000	12	96,000
Prince George's.....	3,665,054	4,800,000	7,500	9	432,000
Saint Mary's.....	2,522,917	3,000,000	4,000	8	240,000
Frederick.....	274,369	332,000			
Total.....	12,536,259	14,532,000	21,300	8.3	1,191,750
VIRGINIA.					
Albemarle.....	1,781,619	3,000,000	4,500	7	210,000
Bedford.....	1,956,157	3,800,000	5,066	8	304,000
Botetourt.....	196,459	650,000	1,200	6	39,000
Brunswick.....	1,121,480	2,522,190	2,500	8	201,775
Buckingham.....	809,937	1,253,580	2,550	7	87,890
Campbell.....	1,761,901	1,813,800	2,250	7	126,966
Caroline.....	417,848	400,000	500	6	24,000
Charlotte.....	1,964,736	1,600,000		8	123,000
Chesterfield.....	194,510	200,000	500	9	18,000
Dinwiddie.....	844,504	495,000	1,320	8	39,600
Floyd.....	157,467	360,000	900	12	43,200
Fluvanna.....	894,023	1,200,000	1,200	10	120,000
Franklin.....	1,696,549	1,900,000	4,000	9	171,000
Hanover.....	439,434	329,574	450	6	19,774
Henry.....	1,129,617	30,000,000	5,000	11	330,000
Lunenburg.....	963,673	775,000	2,000	6.5	50,375
Mecklenburgh.....	2,166,628	4,000,000	7,000	6	240,000
Montgomery.....	204,747	800,000	1,250	18	144,000
Nottoway.....	653,296	914,614	1,400	6	54,876
Patrick.....	323,886	1,001,658	1,178	10	100,165
Powhatan.....	541,430	790,000	700	11	86,900
Pittsylvania.....	4,282,511	6,080,000	14,000	10.5	630,000
Prince Edward.....	960,700	1,200,000	2,400	7.5	90,000
Gooseland.....	405,215	726,000	726	6	43,560
Total.....	25,868,327	38,733,416	62,590	8.5	3,303,081
NORTH CAROLINA.					
Alamance.....	155,570	640,000	1,600	12	76,800
Caswell.....	2,262,053	1,750,000	3,500	10	175,000
Forsyth.....	238,262	1,000,000	2,000	10	100,000
Granville.....	2,134,228	2,200,000	4,400	10	220,000
Orange.....	530,442	1,005,000	2,010	9	90,450
Person.....	1,227,150	1,500,000	3,080	10	150,000
Stokes.....	844,145	900,000	1,600	8	72,000
Guilford.....	177,782	143,412	370	8	11,472
Surry.....	254,286	747,000	2,450	8.5	63,495
Total.....	7,823,918	9,885,412	21,010	9.7	959,217
FLORIDA.					
Gadsden.....	118,799	350,000	450		
KENTUCKY.					
Adair.....	1,231,665	1,500,000	3,000	4	60,000
Allen.....	747,489	750,000	1,000	6	45,000

Tobacco-crop of 1875—Continued.

States and counties.	Pounds, census 1870.	Pounds estimated for 1875.	Number of acres in 1875.	Price per pound, 1875.	Value, 1875.
KENTUCKY—Continued.					
Ballard.....	2,863,455	2,343,600	3,255	<i>Cents.</i> 8½	\$193,473
Boone.....	279,740	560,000	600	6	33,600
Bracken.....	4,188,039	4,000,000	6,666	7	280,000
Breckinridge.....	3,338,471	3,250,000	6,500	7.5	243,750
Callaway.....	1,924,502	2,000,000	2,500	7	140,000
Carroll.....	669,875	700,000	850	8	56,000
Clinton.....	117,238	225,000	425	6	13,500
Cumberland.....	1,304,366	900,000	1,650	7	63,000
Daviess.....	6,273,067	8,500,000	.....	7	595,000
Edmonson.....	414,840	150,000	300	7	10,500
Fulton.....	383,636	500,000	666	8½	42,500
Gallatin.....	157,050	225,000	375	7½	16,312
Grayson.....	859,760	1,300,000	3,222	5	65,000
Green.....	1,375,091	2,000,000	2,750	6.5	130,000
Harrison.....	281,704	275,000	550	9	24,750
Hart.....	2,315,212	1,120,000	1,600	7	78,400
Henry.....	1,375,364	800,000	900	7	56,000
Hopkins.....	3,012,053	5,000,000	8,333	6	300,000
Kenton.....	360,983	500,000	750	7	35,000
Livingston.....	1,086,578	500,000	250	5	25,000
Logan.....	2,707,571	4,656,000	11,640	6½	314,280
Marion.....	132,293	40,000	100	6	2,400
Marshall.....	1,416,282	1,500,000	3,000	6	90,000
McLean.....	2,262,037	1,750,000	8,750	6½	113,750
Monroe.....	674,696	600,000	1,000	5	30,000
Muhlenburgh.....	1,821,988	4,000,000	6,000	7	280,000
Owen.....	2,890,670	3,650,000	7,300	6	219,000
Pendleton.....	1,651,593	1,600,000	2,500	8	128,000
Shelby.....	240,435	145,000	180	7	10,150
Simpson.....	1,072,401	2,000,000	3,600	6	120,000
Taylor.....	1,209,830	1,202,000	3,000	4.5	54,000
Union.....	2,096,260	4,000,000	8,000	7½	290,000
Fleming.....	305,954	600,000	750	7.5	45,000
Metcalfe.....	1,310,381	800,000	500	5	40,000
Oldham.....	301,285	400,000	500	5	20,000
Meade.....	539,000	650,000	100	6	39,000
Total.....	55,192,854	64,691,600	103,062	6.6	4,302,329
TENNESSEE.					
Benton.....	412,435	800,000	1,800	6	48,000
Cheatham.....	419,265	600,000	1,000	8	48,000
Dickson.....	462,130	750,000	1,500	7.5	56,250
Jackson.....	713,578	1,500,000	3,000	5.5	82,500
Macon.....	950,768	600,000	750	6	36,000
Montgomery.....	4,856,378	6,500,000	.....	8.9	578,500
Robertson.....	2,103,322	2,700,000	5,400	8	216,000
Smith.....	2,250,202	3,636,000	4,545	5	181,800
Sumner.....	909,568	337,500	750	5.5	18,562
Putnam.....	131,856	165,500	206	7	11,885
Wilson.....	332,901	600,000	.....	5.5	33,000
Weakley.....	2,599,590	3,603,600	5,148	7.5	270,270
Total.....	16,141,993	21,792,600	24,099	7.2	1,580,467
WEST VIRGINIA.					
Cabell.....	135,410	100,000	150	5	5,000
Kanawha.....	412,469	306,250	245	12	36,750
Mercer.....	117,429	140,000	185	12	16,800
Monroe.....	123,221	160,000	475	10	16,000
Total.....	788,529	706,250	1,055	10.5	74,550
OHIO.					
Adams.....	102,473	150,000	240	12	18,000
Belmont.....	1,480,478	639,518	744	5.5	35,173
Brown.....	2,687,743	550,000	676	9	49,700
Greene.....	277,360	200,000	270	4.5	9,000
Guernsey.....	474,178	450,000	800	5.5	24,750
Monroe.....	2,845,525	2,400,000	4,000	5.5	132,000
Montgomery.....	3,963,183	1,050,000	3,200	5	52,700
Morgan.....	486,125	900,000	1,200	5½	47,250
Noble.....	2,304,557	1,500,000	1,500	5.5	82,500

Tobacco-crop of 1875—Continued.

States and counties.	Pounds, census 1870.	Pounds estimated for 1875.	Number of acres in 1875.	Price per pound, 1875.	Value, 1875.
OHIO—Continued.					
Preble	330,987	290,000	400	<i>Cents.</i> 44	\$12,325
Vinton	110,739	144,000	144	5	7,200
Warren. (total failure)					
Total	15,063,348	8,273,518	13,134	5.6	470,198
INDIANA.					
Pike	1,119,356	1,000,000	1,500	4.5	45,000
Spencer	3,019,970	3,500,000	10,000	6	210,000
Warrick	3,611,775	4,000,000	8,000	5	200,000
Total	7,751,101	8,500,000	19,500	5.3	455,000
ILLINOIS.					
Hamilton	471,860	600,000	1,000	5.5	33,000
Johnson	307,013	196,000	280	5	9,800
Pulaski	157,000	60,000	120	8	4,800
Saline	1,155,941	2,000,000	4,000	5½	110,000
White	135,045	150,000	450	5	7,500
Williamson	1,152,589	2,400,000	4,800	5½	138,000
Edwards	133,150	120,000	160		
Total	3,512,598	5,526,000	10,810	5.6	303,100
WISCONSIN.					
Dane	229,568	(*)	1,929	4	
Rock	645,508	2,210,000	2,210	6	132,600
Total	875,076	2,210,000	4,139	6	132,600
MISSOURI.					
Boone	149,634	1,500,000	2,145	5.5	62,500
Chariton	2,993,981	12,000,000	10,000	5.5	660,000
Franklin	783,270	463,000	590	9	41,670
Howard	788,132	1,500,000	2,500	5	75,000
Lincoln	891,727	700,000	1,200	10	70,000
Montgomery	203,170	187,500	202	10½	19,218
Osage	119,617	250,000	275	10	25,000
Randolph	873,776	4,500,000	5,600	5½	236,250
Ray	190,355	80,000	133	3½	2,800
Saint Charles	146,754	96,000	160	8	7,680
Saline	215,475	2,500,000	2,500	5½	137,500
Stoddard	118,534	210,000	250	5	10,500
Webster	143,162	500,000	625	10	50,000
Total	7,617,587	24,486,500	26,186	5.7	1,418,118

* Almost a failure.

FORESTRY.

The destruction of forests, as affecting the agricultural as well as the manufacturing interests of the country, is a subject of much solicitude just now. How rain-fall is affected by the presence or absence of growing timber, if affected at all, and why its destruction causes a diminution of fountains and springs, and the volume of running streams, are the subjects which produced the following correspondence between the president of the San Diego Society of Natural History and the Commissioner of Agriculture. Inasmuch as the views of the Commissioner are asked upon a debatable subject, they are published for the purpose of eliciting thought and prompting further discussion of the subject.

SAN DIEGO SOCIETY OF NATURAL HISTORY,
San Diego, Cal., November 21, 1875.

SIR: Will you oblige me by a reply in brief, or at length, as convenience will allow, to the following questions upon a subject of much local interest and practical importance here:

What is your opinion regarding the influence of forests and tree-culture upon rain-fall?

Are you able, from observed facts, to show that the rain-fall of regions barren of timber may be increased by the cultivation of trees, or that rain-fall is diminished by the destruction of forests?

Will you be kind enough to refer me to any published facts bearing on this subject with which you are acquainted?

I am, very respectfully,

G. W. BARNES.

To COMMISSIONER OF AGRICULTURE.

DEPARTMENT OF AGRICULTURE,

Washington, April 11, 1876.

DEAR SIR: The subject of your letter is one which has occupied for the last few years much of the attention of scientific men; and while I have a very decided conviction of my own upon which to answer your question, "What is your opinion regarding the influence of forests and tree-culture upon rain-fall?" I should regret that such opinion should exercise any influence to retard the planting of trees or the preservation of existing forests, for both so greatly conduce to the interests of agriculture, mechanics, and health. The existence of a forest indubitably keeps the earth covered by it in a condition to receive and preserve rain-fall, and to administer it gradually to fountains and streams, whereby their supply of water remains undiminished in countries which are not denuded by settlement and consequent cultivation, while in densely-populated States, where forests have all been cut down, the earth is exposed to the sun, the heat, the wind, whereby its surface is made hard, and in a measure impervious to water, which runs off into the streams and is carried away from serving any useful purpose. My opinion is that forests do not conduce to rain-fall.

There is, perhaps, no country that will give a stronger illustration of this subject, at some future day, than many of the States of this Union. Pluviometrical observations have been made for more than sixty years in some of the earliest-settled States, and within that time rain-fall has not diminished. Although this period may not be long enough to establish many other meteorological facts, it is but natural to suppose that an effect upon rain-fall by the existence of a forest, if such an effect were produced at all, would be more or less immediate, yet such an effect has not yet been perceived at all.

It should be remarked, too, that while many of these States have been extensively cleared and cultivated, tree-culture has been largely attended to. And while trees thus planted might produce their effect upon rain-fall, if any such effect is produced; yet they do not operate as forests do, to preserve the condition of the surface of the earth as reservoirs of water, to be distributed gradually to fountains and streams.

I do not know of any work on this subject that contains a more exhaustive view or the question, and of forestry in all its bearings, than that of Prof. George P. Marsh, our present minister at Rome, entitled "The Earth as Modified by the Action of Man." He, after a very thorough statement and analyzation of facts, concludes that "We cannot positively affirm that the total annual quantity of rain is diminished or increased by the destruction of woods, though both the theoretical considerations and the balance of testimony strongly favor the opinion that more rain falls in wooded than in open countries."

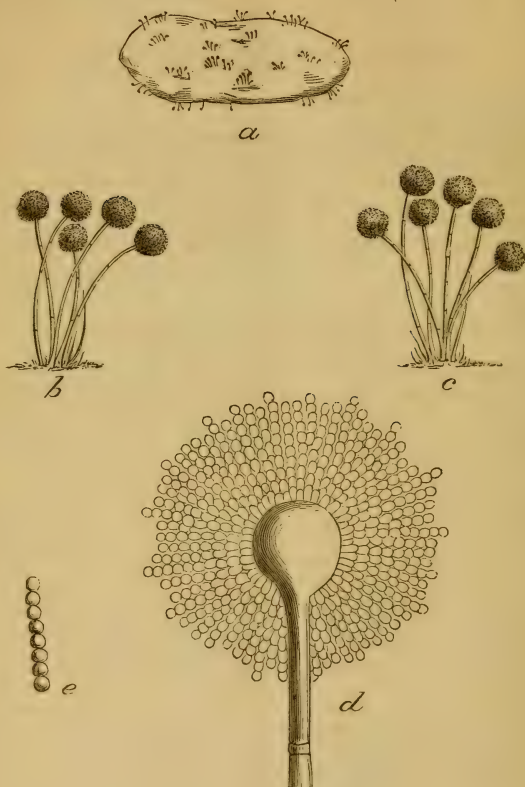
The Academy of Sciences in Vienna has issued a circular calling attention to the fact that for several years a diminution of water in the Danube, and other great rivers, has been observed, and inviting other countries to investigate and report upon any similar facts. A commission has been appointed in Austria for the same purpose, and the unanimous opinion of these scientists is said to be, that the first cause of the injurious decrease of water is due to the devastation of the forests.

The truth of this opinion cannot be controverted, but it leaves the question an open one: Do the forests produce the water, or do they only preserve it?

The Garden, a weekly journal published in England, in its number of November 20, 1875, contains the following: "We have occasionally furnished facts as to the question of the influence of forests on rain, all of which, when accurately recorded, tend to show the influence to be very slight at best. Walker's Statistical Atlas states that the magnificent forests found from Minnesota to Maine have a rain-fall precisely identical with that of the nearly treeless prairies which extend westward from Chicago."

While in reply to your letter of inquiry I have expressed my own decided conviction, that forests do not conduce to increase the amount of rain-fall, I have shown you that

HYPHOMYCETES MUCEDINES.



(*ASPERGILLUS* *glaucus* L.)

a Nat. size.

b and *c* Threads magnified.

d Capitulum in section $\times 500$.

e Spores $\times 500$.

On bread, &c.

the question is open to further investigation; and I desire to enforce the idea of the great necessity for the continuous planting of forest-trees as a protection to the farmer, and his products and material for the mechanic.

Respectfully,

FRED'K WATTS,
Commissioner of Agriculture.

G. W. BARNES, Esq.,
President of the San Diego Society of Natural History.

MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

Aspergillus Micheli.—A genus of Mucedines (Hyphomycetous Fungi) forming common molds, such as the blue of cheese. I have found frequently on moldy cheese in combination with *aspergillus*, *penicillium glaucum*. *Aspergillus* has been found to produce a secondary form of fruit, being that forming the subject of the genus *eurotium*. The accompanying illustration is from an original drawing by M. C. Cook.

FACTS FROM VARIOUS SOURCES.

COTTON-MANUFACTURING IN THE UNITED STATES.—It is gratifying to observe the steady progress of cotton-manufacturing in this country, and especially in the South. The location and exclusive conduct of the business in one corner of the country, and the insane refusal of the cotton section in the past to use its magnificent opportunities to share in the profits of manufacturing, while growling at those who use their facilities even at comparative disadvantage, is a thing of the past, on a par with the practice of importing from other States horses to cultivate cotton, and oats and hay to feed the horses, while half the labor of early summer is spent in killing *grass* in the cotton-fields.

This Department has labored for years to induce the South to make yarns and coarse cottons to the extent of one-third of the crop, part with another third for the finer fabrics made in the North, (eventually this distinction may disappear,) and leave only a third instead of more than two-thirds for foreign consumption. The largest profits now enjoyed in cotton-manufacturing are realized in the South, and there is abundant capital North and South, skilled artisans obtainable for prompt initiation of the abundant and needy home-supply of material for efficient and cheap labor. Only the inertia of southern habits and timidity of northern capital prevent. Let such a result be attained and we shall hear no grumbling about unremunerative prices for cotton, lack of employment for labor, or wholesale purchase abroad of the bulky raw products of agriculture; and the time would not be long ere the annual products of industry in the South would reach the value of *five* dollars for every *one* now produced, and heavy exports of manufactured cotton would be made to every country in the world, including England.

The number of spindles reported in operation in the South in 1869 was 225,063, increased to 262,221 in 1874, and to 481,821 in 1875. The quantity of cotton used has reached 67,733,140 pounds, about $3\frac{1}{2}$ per cent. of the amount produced. The following is the record of home

manufacturing, as prepared by the secretary of the Manufacturers' Association and published in the Financial Chronicle:

	Number of mills.	Number of spindles.	Average size of yarn.	Average running time.	Average consumption of cotton per spindle.	Quantity of cotton used.	Quantity of cotton used.
NORTHERN STATES.							
			<i>Number.</i>	<i>Weeks.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Bales.</i>
Maine.....	27	633,944	23.14	50.50	53.00	33,603,236	72,421
New Hampshire.....	36	815,709	22.66	50.22	70.25	57,326,126	123,535
Vermont.....	10	46,344	29.55	50.54	51.51	2,372,420	5,513
Massachusetts.....	206	3,775,634	22.69	46.17	55.33	202,894,352	450,204
Rhode Island.....	129	1,438,479	33.88	48.00	42.69	61,409,470	132,348
Connecticut.....	108	889,784	30.66	47.25	51.12	45,492,513	98,044
New York.....	60	615,205	36.38	49.65	46.30	28,473,469	61,365
New Jersey.....	22	178,928	29.13	50.83	57.62	10,114,300	21,798
Pennsylvania.....	60	451,900	18.07	43.62	69.85	31,572,305	68,044
Delaware.....	8	48,276	23.17	52.00	69.96	3,358,162	7,246
Maryland.....	20	127,352	11.05	47.88	168.25	21,368,020	46,052
Ohio.....	4	13,000	8.00	43.50	135.69	1,764,000	3,802
Indiana.....	4	22,088	15.70	48.55	141.70	3,261,240	7,029
Total North.....	694	9,057,543	22.42	47.52	56.25	509,009,613	1,097,001
SOUTHERN STATES.							
Alabama.....	14	58,480	12.75	45.50	114.51	6,756,170	14,561
Arkansas.....	2	1,721	10.38	46.34	73.56	132,400	285
Georgia.....	47	131,340	12.87	46.35	177.39	23,299,303	50,214
Kentucky.....	3	9,514	6.92	50.45	254.40	2,420,362	5,216
Louisiana.....	3	2,260	8.50	50.00	315.50	713,033	1,537
Mississippi.....	9	18,256	11.07	46.00	110.60	1,990,800	4,291
Missouri.....	3	19,700	11.85	46.05	140.52	2,810,485	5,057
North Carolina.....	31	54,500	11.28	43.97	121.72	6,694,641	14,428
South Carolina.....	18	70,282	14.00	51.15	137.57	9,671,028	19,945
Tennessee.....	40	55,384	11.66	43.17	121.85	6,701,718	14,443
Texas.....	2	5,700	12.00	50.63	172.34	982,365	2,117
Virginia.....	9	54,624	15.22	51.63	115.85	5,560,835	11,981
Total South.....	181	481,821	12.67	49.07	140.57	67,733,140	145,079
RECAPITULATION.							
Total North.....	694	9,057,543	22.42	47.52	56.25	509,009,613	1,097,001
Total South.....	181	481,821	12.67	49.07	140.57	67,733,140	145,079
Grand total.....	875	9,539,364	27.60	47.60	60.46	576,742,753	1,242,080

For the sake of comparison, the figures for previous years are given:

		Spindles.	Yarn, average.	Average per spindle.	Total consumption.	
					Pounds.	Bales.
1875.						
North		9,057,543	22.42	56.25	509,009,613	1,097,001
South		481,821	12.67	140.57	67,733,140	145,079
Total 1875		9,539,364	27.60	60.46	576,742,753	1,242,080
1874.						
North		8,927,754	22.56	56.86	507,790,099	1,094,387
South		487,629	12.5	122.53	59,793,774	128,526
Total 1874		9,415,383	27.73	60.29	567,583,873	1,222,913
1870.						
North		6,851,779	22.7	50.87		
South		262,221	12.1	124.23		
Total 1870		7,114,000	22.8	52.93		
1869.						
North		6,538,494	22	60.70		
South		225,063	12.1	138.12		
Total 1869		6,763,557	27.1	64.22		

INSURANCE OF CROPS.—The insurance of farm-buildings is never omitted by prudent farmers. Protection against losses of farm-animals by disease or accident has long been practiced abroad and is a usage introduced into this country. The insurance of crops against losses by unfavorable meteorological conditions, floods, insects, &c., may be to some a new idea, but it is an old custom, having been practiced in China, as is stated, for ages; and it is even beginning to claim attention in this country. Insurances are effected on the mutual plan of the fire fire-insurance companies, securing against heavy losses by the payment of annual premiums, not full crops, or even average crops, but a moderate return that would save the farmer from disaster. The idea is at present interesting the rural mind.

ILLINOIS STATE DAIRYMEN'S ASSOCIATION.—At the late annual meeting of the Illinois Dairymen's Association, strong ground was taken against the manufacture of cheese from skimmed or partly-skimmed milk. Mr. Wanzer, of Elgin, a prominent manufacturer, who has heretofore to a large extent made butter and cheese from the same milk, stated his convictions that such a course was not for the best interests of makers and patrons; the odors consequent on cheese-making affected the quality of the butter; and, in the end, other things being equal, the factory would reap the most profit by devoting itself either to butter or to cheese alone. The association adopted a resolution to the effect that the making skimmed or partly skimmed cheese is detrimental to the dairy business, giving facilities to dishonest sellers for imposing inferior goods on consumers in place of finer qualities, and leading to a general depreciation in reputation of cheese coming from regions where skimming is prevalent. It was also resolved to petition the legislature to enact a law requiring manufacturers to brand their cheese according to its character; that is to say, whether from skimmed, partly skimmed, or whole milk; the name of the maker to be stamped on the cheese.

We find in the secretary's report a tabular account of sales on the Elgin Dairy Board of Trade from March 2 to December 7, 1875, a condensation of which we here present:

Dates.	Cheese.			Butter.	
	Pounds.	Prices.		Pounds.	Prices.
		Lowest.	Highest.		Average.
March 2 to March 30	283, 582	\$0 14	\$0 15	57, 330	\$0 37
April 20 to April 27	77, 074	10½	13	6, 150	37½
May 4 to May 25	221, 734	9½	13	9, 000	35½
June 1 to June 29	485, 024	8	10	13, 000	32
July 6 to July 27	589, 137	9	10	12, 300	31
August 3 to August 31	458, 455	9	10½	13, 900	33
September 7 to September 23	695, 620	9	10½	23, 335	33
October 6 to October 26	566, 600	11	12½	35, 860	35
November 2 to November 23	514, 950	11½	12½	40, 600	36
December 7	76, 610	11	11½	13, 700	35
Total	3, 970, 786			225, 175	

REMEDY FOR SMUT IN WHEAT.—Our correspondent in Mora, New Mexico, reports that all the wheat in that county is much affected with smut. In many instances growers state that their crop was half smut. For two years he has tried, with excellent results, a preventive recommended by Mr. Pendaries, a native of Montauban, France, now residing in that locality. It is as follows:

For ten bushels of wheat, put sixteen ounces of blue vitriol in a boiler with ten gallons of water and heat thoroughly. This mixture is sprinkled, boiling hot, over the wheat, which is then gathered into a heap and left to absorb the mixture for one day. It is then spread out again and allowed to dry.

HOPEFUL SPRING PROSPECTS.—Under date of February 28, our correspondent in Dooly County, Georgia, reports that, owing to the mildness of the winter, there has been no occasion to shelter stock. Cattle and sheep are free from any prevailing disease, and 40 per cent. better in condition than a year ago. At that date planters were already putting in corn, which was something very unusual. He also states:

There is 30 per cent. more wheat sown than last year, and I never saw it look finer. I may also say, speaking accurately, that there is 50 per cent. more of oats sown. The low price of cotton has induced many planters to invest largely in grain, which is an omen of better times for Dooly County.

A NEW FORAGE-PLANT AND FERTILIZER.—A correspondent of the Georgia commissioner of agriculture calls his attention to a new forage-plant, which first appeared on a farm of forty acres in Liberty County, Georgia, owned by two freedmen, and was first noticed in 1871. It appeared to be a troublesome weed, springing up very thickly after the crops were laid by. It began to spread and soon covered every foot of uncultivated ground. It has since spread over a large surface, and has reached points several miles distant from its original point of development. But, so far from being a nuisance, as was at first suspected, it has proved a great boon to the worn-out lands of the South. It is relished by farm-animals, both in the green and the cured state. As a fertilizer its application in one case indicated qualities superior to stable-manure. A farmer plowed under two acres of this plant, and on an adjoining two acres a coating of stable-manure was spread. The first two acres produced twice as many bushels of corn as the second two. It is known as Mexican clover, and is a leguminous plant. In many localities it has driven out all other grasses. It seeds heavily, but is not an early grower; and hence it never gets in the way of young crops. The first light frost in the fall kills it.

SHEEP-HUSBANDRY IN OREGON.—The following is a condensed statement of facts respecting his own experience in growing sheep and wool in Oregon, communicated by our correspondent in Marion County, Mr. John Minto. He began to keep sheep in 1849, with good common stock from Missouri. In 1858 he crossed these with Southdowns. In 1860 he obtained thoroughbred Merinoes, partly from Vermont and partly from New South Wales. When received they averaged 6 pounds per fleece, of very fine unwashed wool. The average per fleece of the Vermont Merino ewes was $8\frac{1}{2}$ pounds; of the rams, $11\frac{3}{4}$; ranging on grass and sheltered at night in the winter.

He says:

The average number of lambs saved per 100 ewes varies with the breed; with the common stock, 100 per cent. is a very fair result, though I have often saved more than that; with Southdowns, 120 per cent.; with Cotswold and Leicester, 100 per cent. when kept in small flocks; with Merinoes, 85 per cent. In my experience, all these breeds diminish the ratio of their increase as the flock is increased—the Merino in the least degree and the long-wools in the greatest. The percentage here given is what may be realized when sheep are a part of a system of mixed husbandry in Western Oregon, as I have conducted it. Under such circumstances, the cost of keeping on land worth \$20 per acre does not vary much from \$1 per head. Such land, devoted to sheep exclusively, I think would carry 3 per acre.

For the past four years my wool has sold at an average of 32 cents per pound. There is not much difference made in this market between that from common sheep and that from improved stock. Usually that of the latter commands 2 or 3 cents more, chiefly because those keeping up the improvement of their flocks are known generally to

have their wool-crop in good condition. The wool of Western Oregon, as a whole, always commands the highest price in the Pacific coast market.

The following is the account of my flock for 1874: From 262 sheep, 1,883 pounds of wool, at 32 cents per pound, \$602.64; 69 sheep sold for \$1,608; cash income, \$2,210.64. Increase of flock by lambs, 126; decrease by sale, 69; leaving the flock of 262 increased to 319. About one-half are thoroughbred Merino and the other half grades of common stock with a few Leicesters; 204 are ewes and ewe lambs; 49 wethers of various ages, such as were not deemed fit to keep for rams; and 66 rams of various ages. My chief income is from the sale of rams. Good grades as well as thoroughbreds are kept for that purpose, not because the former in value for use are to be compared with the latter, but because many beginners in wool-growing cannot at first see the economy of buying the latter, though they generally come to see it with experience. Sheep, as a rule, are kept on pastures or bush-lands the year round; their chief enemies being the dogs, the coyotes, and negligent owners.

IMPROVEMENT IN STOCK-GROWING.—*Texas, Bexar*: The Kansas trade will about clear the county of stock this spring. The stock interest in the county is undergoing a rapid change. Stockmen are fencing pastures and introducing the best bulls from Kentucky, Missouri, and Ohio for crossing with native cows.

RELATIVE VALUE OF VARIETIES OF COTTON.—*M. S. A. Duke, of Drew County, Arkansas*, reports to this Department the results of an experiment designed to ascertain the relative value of the Peeler, the Boyd, and the Dickson varieties of cotton. He divided a field of about three acres into three lots, and on each, accurately measured, planted one kind. The land was of the same quality except that perhaps the plat on which the Dickson variety was planted was slightly superior. The figures below express the rate per acre as deduced from the carefully-ascertained facts in each item. The prices per pound are those for which the products of the several varieties were sold in the New Orleans market.

Variety.	Seed-cotton.	Lint.	Per cent. of lint.	Value per pound.	Total value.	Cost of production.	Netprofit.	Per cent. of profit on cost.
	<i>Pounds.</i>	<i>Pounds.</i>		<i>Cents.</i>	<i>Dollars.</i>			
Peeler	1,951	514.7	26.38	14½	74 12	\$46 27	\$28 36	61.27
Boyd	1,956	588.78	30.1	12½	72 12	46 24	25 88	56
Dickson	2,497	738.37	29.56	12½	90 45	54 66	35 79	65.5

The seed-cotton was weighed in the field by the pickers each day, and that weight is given. Mr. Duke says:

Had the first picking been thoroughly dried before weighing, it would have made some difference in the percentage of lint. On the first picking the average per cent. of lint of the three varieties was 27.33, while the last picking was 32.67, or an average on the whole crop of 30 per cent. of lint. If the weight of bagging and ties were included, which is always done in commercial transactions, the average per cent. of commercial cotton is 32.

The greater cost in producing the Dickson cotton arises from the greater quantity to be picked, the price of picking being \$1 for every 100 pounds of seed-cotton.

IMPROVEMENT IN THE CARE OF STOCK.—*Georgia, Harris*: The great difficulty here is in carrying stock through the winter and procuring rough food for them. Unusual attention is now paid to grazing-lots and shelters for stock, and more grain has been sown than ever before.

BAD FARMING.—*Mississippi, Lowndes*: This county has been importing corn, wheat, meat, mules, and horses for the last nine years. Cotton has been the specialty. No stock of any kind, worth mentioning, has been raised. The low price of cotton and high price of provisions will force

planters to pursue a different course in future. We hope for a great improvement in the development of our resources, including a diversity of crops and an improved system of agriculture.

GOOD FARMING.—*Kansas, Dickinson:* During the last three years some first-class stallions have been introduced, and the result is satisfactory. There has been the greatest improvement among cattle and milch-cows. Texas cattle are rapidly disappearing and short-horns are rapidly increasing. The few farmers raising sheep are introducing Cotswold, Shropshire, and Southdown rams, thus producing longer and closer wool. The finer breeds of hogs, such as Poland China, Magee, and Chester Whites, are abundant here.

INDUSTRIES OF BUFFALO COUNTY, WISCONSIN.—The following is a condensed statement of facts reported to the Department by Mr. William Myer, secretary of a farmers' club at Nelson. The farm-products of the county and the numbers of farm-stock in 1875 were as follows:

Kinds.	Acres.	Bushels per acre.	Total.	Stock.	Numbers.
Corn	8, 125	12	97, 500	Cattle	15, 218
Wheat	41, 334	21	868, 014	Horses	4, 190
Oats	10, 532	50	526, 600	Mules	198
Barley	791½	30	23, 745	Sheep	8, 252
Rye	334	18	6, 372	Hogs	6, 389

The corn-crop was greatly reduced by an early frost—a rare occurrence. There were also cultivated about 1,000 acres of potatoes, yielding 75 bushels per acre, and 14½ acres of hops, yielding 800 pounds per acre. The average value of farm-lands per acre is \$9.20. The county, lying on the banks of the Mississippi, with Chippewa River on the north-west, Beef river through the center, and Trempeleau Mountain river on the southeast, is well watered. Its numerous brooks are filled with speckled trout. The soil is generally good, and on the hills and bluffs timber of excellent quality abounds. The manufacture of lumber is extensively carried on, the Alma Company alone employing 300 hands. Mr. Myer says:

Buffalo County raises the best wheat for milling produced in the Northwest. Its markets are good, and its farmers are prosperous and happy. As the streams afford abundant water-power, the county offers great inducements to manufacturers of all kinds.

THE OSIER-WILLOW, (*Silex viminalis*).—In our Annual Report for 1873, page 254, is a communication from Mr. E. Ware Sylvester, respecting a rising industry in the culture of this plant, for economic purposes, in Onondaga County, New York. The first experiments gave promise of complete success in the culture, with very profitable results, the net profit being \$80 per acre. But in the summer of 1873 a variety of the saw-fly worm (*Nematus ventricosus*) ruined promising crops on Mr. Sylvester's plantation of 15 acres, in Lyons, and on a plantation of 60 acres near Syracuse. White hellebore was found effectual for destroying the worms to which it was actually applied, but not for exterminating the ever-multiplying swarms which came to replace them. In a communication to the Department, dated November 11, 1875, Mr. Sylvester writes:

I am happy to inform you that the worms have decreased yearly, until there were so few last summer that less than a day's work of one hand, with a bellows loaded with hellebore, sufficed to destroy them. I have a good crop of willows, which I am now cutting and delivering, unpeeled at the railroad, one mile distant, on a contract at \$18

per ton. So far as we can judge, the worm has been mainly destroyed by natural causes, and we have every reason to hope that its absence will be permanent. If so, the energy of our people will be directed to the growth of willows, and in a few years we shall save to the country the hundreds of thousands of dollars in gold now annually sent abroad for willows and willow-ware.

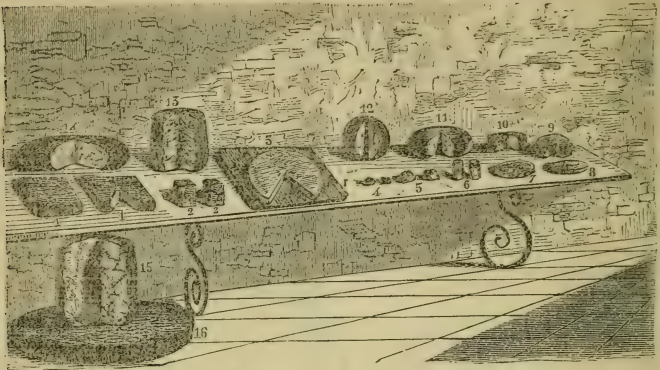
BEEF PRODUCTION IN NEW MEXICO.—Agricultural industries, which bring with them homes, cultivation, mechanic arts, schools, and churches, in place of unpopulated prairies, are gradually banishing cattle-growing on the former vast scale from Texas. The following are among other indications that the business, with very remunerative inducements, is advancing into New Mexico, where it will also become the pioneer of other agricultural industries. It is reported that, five years ago, Messrs. Lacy, Coleman, and Allison imported into Colfax County cattle, principally from Texas, amounting in value to \$14,000. Since then they have sold off about \$40,000 worth, and have remaining about 7,000 cattle, averaging in value \$18 per head, aggregating \$126,000, or \$14,000 converted into \$166,000 in five years. It is further reported that in the Vermejo district of the county alone, there are now 25,000 cattle of pure and mixed breeds, and the number is constantly increasing.

CONTENTS OF A TIERCE.—In response to a letter from the Commissioner, S. H. Grant, esq., superintendent of the New York Produce Exchange, states that the tierce in which salt meat is packed is about the same as the wine-measure tierce of 42 gallons, being 32 inches long, with heads 20 or 21 inches in diameter; the standard weight of beef packed in a tierce is 304 pounds. Charles Reynolds, esq., secretary of the Chicago Board of Trade, states that under the regulations of that board a tierce for packing meat is either 32 inches long, with heads 21 inches in diameter, or 33 inches long, with heads 20½ inches in diameter. For pork or beef hams the standard contents of the tierce are 300 pounds; of mess or India beef, 304 pounds; of lard, 320 pounds.

SMALL CHEESES.—The immense size of our factory Cheddars, and the uniformly large cheeses of private dairies, answer well for cutting by market retailers and in retail groceries of large trade, but are far from convenient for family use. The purchase of cheese in pound-slices, at 20 to 25 cents for a fair to prime article, is unnecessarily expensive, almost to the prohibitive point in its effect upon consumption. In this country the small pine-apple cheese is made to a limited extent, and sold at high prices. The comparatively small Holdridge cheeses, rectangular in shape, and weighing 10 to 15 pounds, though not extensively made, command a remunerative price. A few imitations of small German cheeses sell at higher prices than the regulation factory-pattern of 60 to 70 pounds. It would prove a positive advantage, both to house-keepers and cheese manufacturers, if the fashion could be set for small cheeses. The Stilton and other small cheeses, convenient to place upon the table, are far more common in England; and in some of the continental countries of Europe small cheeses are the rule rather than the exception.

At the *Concours Agricole*, at the Palace of Industry in Paris, in progress from the 12th to the 16th of February last, the exhibition of cheese included a large number of forms, of kinds some of which are well known to epicures of this country. An engraving of sixteen of these forms will give an idea of the great diversity and shape, and may furnish a hint to the cheese-makers of this country who feel inclined to cater for the supply of a manifest need. Among these are included the well-known cheese of Neufchatel, Brie, Gruyere, and Roquefort; cheese in tile-form, paving-blocks, flat, and various irregular forms;

cheese of milk of cows and of goats, of all degrees of richness, and of various modes of manufacture. The following is a list of the cheeses



delineated in the cut: 1. Maroilles en tuile de Flandre.—2. Maroilles en pavé.—3. Brie.—4. Fromage de chèvre raffiné.—5. Le même, frais.—6. Neufchâtel raffiné.—7. Mont d'Or.—8. Camembert.—9. Livarot.—10. Roquefort.—11. Fromage d'Edam.—12. Tête de mort.—13. Chester.—14. Fromage de Gex.—15. Fourme d'Auvergne.—16. Fromage de Gruyère.

ENGLISH EMIGRATION STATISTICS.—The statistical and commercial department of the British Board of Trade has issued a return, showing that the total number of emigrants, native and foreign, that left British ports during 1875 was 173,809, a decrease of 67,205 from the aggregate of 1874. Of this number 84,540, or 48 per cent., were English, showing a decline of 31,950 from 1874; 14,686, or about $8\frac{1}{2}$ per cent., were Scotch, a decline of 5,600 from the previous year; 41,449, or 23 per cent., were Irish, a decrease of 19,047; 31,347, or 18 per cent., were foreigners in transit, a loss of 7,118; the number undistinguished was 1,787, against 5,277 the previous year.

Of the grand aggregate of 173,809 persons, 105,046, or 60 per cent., were destined to the United States, against 61 $\frac{1}{2}$ per cent. in 1874. This quota was composed as follows: English, 43,867; Scotch, 5,893; Irish, 31,433; foreigners, 23,028; undistinguished, 825; being 52 per cent. of the English emigration, 40 per cent. of the Scotch, 75 per cent. of the Irish, 73 per cent. of the foreign, and 49 per cent. of the undistinguished.

British North America received 17,378, or 10 per cent. of the whole, against 10 $\frac{1}{2}$ per cent. in 1874, including 9,044 English, 1,871 Scotch, 1,391 Irish, 5,016 foreigners, and 56 undistinguished; being 10 $\frac{1}{2}$ per cent. of the total English emigration, 13 per cent. of the Scotch, 3 $\frac{1}{2}$ per cent. of the Irish, and 16 per cent. of the foreign.

The Australian colonies received 35,525, or 20 per cent., against 22 $\frac{1}{2}$ per cent. in 1874, including 20,749 English, 5,750 Scotch, 8,251 Irish, 767 foreigners, and 8 not distinguished; being 24 $\frac{1}{2}$ per cent. of the English emigrants, 40 per cent. of the Scotch, 50 per cent. of the Irish, and 2 $\frac{1}{2}$ per cent. of the foreign. The remainder went to other countries, and constituted an increased per cent. of the whole.

BRITISH AGRICULTURAL STATISTICS OF 1875.—The area in wheat declined last year nearly 10 per cent., and the proportion of wheat to all cereals declined from 38.5 to 35.4 per cent. The proportion in barley increased from 24.3 to 26.5 per cent.; and the increase in oats was from 27.5 to 28.2 per cent. There was an increase in cereal (corn) crops over the previous year of 20,170 acres, or less than a fourth of 1 per cent.; and in green crops, of 82,837, or over 2 per cent.

In the following table the figures for Wales are excluded in the total for Great Britain, as also are those for the Isle of Man and the Channel Islands. The total corn-crops of Wales, cover 512,173 acres, instead of 516,001, and 13,085 acres of green crops, instead of 13,956, a small decline in both. In the former class the order of prominence is oats, barley, wheat, pease, beans, rye.

Crops.	Year.	England.		Scotland.		Ireland.		Great Britain.	
		Acres.	Proportions of each kind.	Acres.	Proportions of each kind.	Acres.	Proportions of each kind.	Acres.	Proportions of each kind.
CORN CROPS.									
Wheat	1874	3,391,440	45.2	120,991	8.6	152,711	9.9	3,630,300	38.5
	1875	3,123,547	41.5	102,137	7.2	161,321	8.4	3,342,481	35.4
Barley or bere.....	1874	1,889,722	25.2	245,840	17.5	212,230	11.2	2,287,987	24.3
	1875	2,090,423	27.8	264,834	18.8	234,509	12.2	2,509,701	26.5
Oats.....	1874	1,356,793	18.1	1,004,024	71.2	1,460,186	77.8	2,596,384	27.5
	1875	1,421,951	18.9	1,004,888	71.2	1,499,371	78.3	2,664,009	28.2
Rye.....	1874	36,484	.5	9,013	.6	8,979	.5	47,228	.5
	1875	43,544	.6	9,766	.7	9,556	.5	54,903	.6
Beans.....	1874	526,561	7.0	23,722	2.0	9,646	.5	559,044	5.9
	1875	533,455	7.1	27,328	1.9	9,970	.5	564,181	6.0
Pease.....	1874	303,966	4.0	1,823	.1	1,756	.1	310,547	3.3
	1875	310,623	4.1	1,976	.2	1,677	.1	316,375	3.3
Total.....	1874	7,505,076	100.0	1,410,413	100.0	1,901,505	100.0	9,431,490	100.0
	1875	7,522,543	100.0	1,410,929	100.0	1,916,398	100.0	9,451,650	100.0
GREEN CROPS.									
Potatoes	1874	314,571	11.4	160,420	23.4	892,421	65.9	520,430	14.5
	1875	320,477	11.2	157,671	23.0	900,277	65.7	522,653	14.3
Turnips and swedes	1874	1,560,857	56.5	501,636	73.2	333,487	24.7	2,133,336	59.6
	1875	1,569,049	55.1	503,323	73.5	332,783	24.3	2,142,698	58.5
Mangel.....	1874	314,623	11.4	1,610	.2	32,161	2.8	322,614	9.0
	1875	352,198	12.4	2,158	.3	43,172	3.2	361,617	9.8
Carrots	1874	12,714	.4	874	.1	3,359	.3	13,927	.4
	1875	13,591	.5	984	.2	3,303	.2	14,936	.4
Cabbage, kale, rabi, and rape.....	1874	163,081	5.9	5,227	.8	41,105	3.0	169,285	4.7
	1875	183,402	6.4	5,094	.8	41,896	3.1	189,733	5.2
Vetches, lucerne, and any other green crop, except clover or grass.....	1874	393,276	14.4	15,305	2.3	44,829	3.3	421,678	11.8
	1875	409,756	14.4	15,319	2.2	48,655	3.5	432,470	11.8
Total.....	1874	2,764,182	100.0	685,132	100.0	1,353,392	100.0	3,581,270	100.0
	1875	2,842,473	100.0	684,549	100.0	1,370,056	100.0	3,664,107	100.0

STEAM-CULTURE.—According to the reports of the Royal Agricultural Society of England, 161 pounds of coal will raise into steam 115 gallons of water, a power sufficient for the cultivation of one acre. One pound of coal will evaporate 7 pounds of water and move 9.3 tons of earth, and a cwt. of coal will move 1,000 tons of earth, a power sufficient for

the plowing of 100 acres. The great practical question is the utilization of this power. A variety of steam-plows have been invented, but all have yet failed to economize and apply the force generated. In England, at the great trial at Wolverhampton, under the auspices of the Royal Agricultural Society, it was estimated that 30 per cent. of the power generated was lost, yet even this leaves steam-power cheaper than horse-power.

FARM-PROFITS.—A correspondent of the Norwich (England) Gazette was taken to task by a farmer for having estimated the average profits of English farming at $17\frac{1}{2}$ per cent. He replied, "You farm 120 acres of land at a cost of £1,000?" "Yes." "Your living costs you £150 per annum, and you save something beside?" "Yes." "Well, there is 15 per cent. on your outlay." Another interlocutor confessed to a return of 18 per cent. on £2,000, his outlay in taking 250 acres.

FATTENING FARM-ANIMALS.—The Agricultural Gazette is of opinion that in England "all plans for feeding which aim at the economical production of meat will be every year more followed and appreciated; and that a good system for pulping roots in the field for fattening sheep must be included among such useful plans." The cost of fattening cattle is variously stated. A few years ago 7 or 8 shillings per week was thought to be sufficient to cover the cost of fattening a bullock, but the weight of opinion indicates that such cost has been enhanced in late years 50 or 60 per cent. One experiment with 14 calves, fed fifty-six weeks, is given, showing an average cost of 10s. per head per week, while the average return was 12s. 3d., besides their droppings. The Gazette recommends an average weekly ration of 28 pounds of linseed cake and 42 pounds of meal, amounting, at $1\frac{1}{4}$ d. per pound, to 7s. $3\frac{1}{2}$ d.; $3\frac{1}{2}$ cwt. of roots, at 3d., $10\frac{1}{2}$ d.; 3 stone of hay, at 9d., 2s. 3d.; 15 per cent. per annum for interest and risk on £22, value per bullock, for 13 weeks, 1s. 3d.; labor, allowing each bullock one-fortieth part of a good man's weekly wages of 16s., 5d.—total, 12s. 1d. If bullocks can be made to lay on $1\frac{1}{2}$ stone or 21 pounds of beef per week, at 10s. per stone they are a profit; but if only increasing one stone per week, there will be a loss. The diet above recommended it is thought will make the yield somewhere between 14 and 21 pounds per week.

FRUIT-CULTURE IN ENGLAND.—At a late meeting of the Institution of Surveyors, Mr. G. Webb read a paper showing that the returns of 1874 present an area in fruit-culture, in England, of 145,622 acres, not including gardens. The largest county acreages are: in Devon, 24,312; in Hereford, 21,534; in Somerset, 19,857; in Worcester, 13,390; in Gloucester, 11,152; in Kent, 11,186; in Cornwall, 4,180; the other counties have less than 4,000 acres each.

Mr. Webb prefers an eastern exposure, for the reason that the gradual contact of the sunbeams with the trees is more advantageous to the fruit-bloom. Shelter on the southwest is desirable, either by a high quick hedge or a belt of larch, against the gales from that quarter. Among the finest varieties of fruit is mentioned the Chaumontel pear, which grows to especial excellence on the island of Jersey, and commands a shilling each. They also do well in Kent, at an altitude of not over 100 feet above sea-level; at 300 feet it is no better than a turnip. The Williams, Beurré Base, and Copiamont are favorites; while the showy Buerré d'Amaulis, Colmar d'Été, and Gratioli are but little regarded. The Keswick Codlin apple formerly sold well, but has become too plentiful, and hardly pays expenses. The Bigarreau and Dulce cherries flourish at from 30 to 200 feet above sea-level; Black

Heart, Kentish, and Turkey Hearts do fairly up to 400 feet; but beyond this the crop becomes precarious and the fruit indifferent. Apples have been grown to the extent of 500 bushels per acre. Small fruit has also been financially successful, especially the gooseberry and the raspberry.

FRENCH WINE-CROP OF 1875.—The French wine-crop has turned out greater than even the large statements of it hitherto. The *Moniteur Vinicole* gives the aggregate at 83,632,391 hectoliters, (2,209,381,398 gallons.) This is the largest yield ever realized, the next largest, that of 1874, being 78,124,424 hectoliters, or 2,063,875,408 gallons. In some parts of the field the dreaded *Phylloxera* still continues its ravages, and no specific remedy has yet been discovered. The insect has attacked the young vines planted to replace the old ones destroyed. The departments of Vaucluse and Gard have especially suffered from this cause. Vaucluse ten years ago produced nearly 80,000,000 gallons; in 1875 less than 2,000,000. In the department of Gard the yield has fallen from 105,671,200 gallons to about 25,000,000. The products of the different departments in 1875 are stated as follows: Ain, 20,557,882 gallons; Aisne, 6,071,603 gallons; Allier, 13,519,309; Alpes, (Basses,) 3,207,886; Alpes, (Hautes,) 2,841,408; Alpes Maritimes, 2,218,223; Ardèche, 5,823,434; Ardennes, 1,260,129; Ariège, 4,112,935; Aube, 38,829,754; Aude, 98,249,093; Aveyron, 16,314,852; Bouches-du-Rhone, 7,637,174; Cantal, 475,653; Charente, 143,716,413; Charente-Inférieure, 229,685,177; Cher, 19,432,036; Corrèze, 10,130,804; Côte-d'Or, 55,181,870; Creuse, 6,816; Dordogne, 35,597,932; Doubs, 14,128,952; Drôme, 6,262,286; Eure, 668,370; Eure-et-Loire, 2,183,062; Gard, 24,937,505; Garonne, (Haute,) 28,478,468; Gers, 31,570,143; Gironde, 139,472,775; Hérault, 248,940,028; Ile-et-Vilain, 20,474; Indre, 15,504,078; Indre-et-Loire, 57,355,316; Isère, 23,010,476; Jura, 22,432,041; Landes, 10,233,675; Loir-et-Cher, 52,029,751; Loire, 11,714,366; Loire, (Haute,) 2,649,616; Loire Inférieure, 69,624,085; Loiret, 40,030,205; Lot, 15,632,205; Lot-et-Garonne, 36,820,129; Lozère, 184,291; Maine-et-Loire, 20,723,702; Marne, 26,080,788; Marne, (Haute,) 31,437,182; Mayenne, 14,794; Meurthe et Moselle, 39,200,791; Meuse, 21,285,349; Morbihan, 556,940; Nièvre, 15,621,294; Oise, 229,465; Puy-de-Dôme, 34,369,479; Pyrénées, (Basses,) 4,207,603; Pyrénées, (Hautes,) 3,928,986; Pyrénées Orientales, 38,363,216; Rhone, 34,181,541; Saone, (Haute,) 25,531,826; Saone-et-Loire, 58,669,552; Sarthe, 5,015,868; Savoie, 7,388,055; Savoie, (Haute,) 5,199,578; Seine, 1,640,206; Seine-et-Marne, 17,547,363; Seine-et-Oise, 10,914,646; Sèvres, (Deux,) 13,752,578; Tarn, 22,386,180; Tarn-et-Garonne, 12,069,685; Var, 37,084,093; Vaucluse, 1,802,222; Vendée, 26,840,009; Vienne, 40,607,713; Vienne, (Haute,) 640,446; Vosges, 8,469,706; Yonne, 75,832,374. At least thirty-seven of these departments exceed the average annual yield in the United States; some of them amount to sixty times our annual yield.

FRENCH SUGAR-PRODUCTION.—From statistics published in *le Journal Officiel* it appears that during the year ending with October 31, 1875, the number of beet-sugar factories in operation was 523, against 514 the previous year; the number inactive was 6, against 10 the previous year. The juice defecated amounted to 26,000,000 hectoliters, (686,862,800 gallons,) against 21,500,000 hectoliters (567,982,700 gallons) last year. The density of the juice was 32.8, against 32.9, and the yield 137,000,000 kilograms, (302,048,969 pounds,) against 118,000,000 kilograms, (260,158,966 pounds.) The export of raw sugar declined from 41,000,000 kilograms (90,394,217 pounds) to 20,000,000 kilograms,

(44,094,740 pounds,) leaving the stock on hand about the same as last year, or 22,000,000 kilograms, (48,504,214 pounds.) White pulverized sugar constitutes 56 per cent. of the entire manufacture, against 53 per cent. in 1874. The statistics of 1875 show a rapid working of the raw material, a great abundance of roots, but a depressed yield of the per cent. of sugar, a greatly decreased export of raw sugar, and an increased export of the refined article. Later statistics show that for the three months closing with January the amount defecated was 919,386,147 pounds, against 765,094,496 during the same period of the previous year. The density of juice was 3.6, against 3.8 the previous year. The export amounted to 178,119,144 pounds, a falling off of 104,846,080 pounds compared with the same period in the previous year.

FRENCH AGRICULTURAL EXPORTS.—During the first ten months of 1875 the value of French wines exported amounted to 219,253,000 francs, an increase of 24,224,000 francs over the same period of 1874; cereals, 196,539,000 francs, an increase of 101,000,000 francs; brandy, 67,804,000 francs, an increase of 9,976,000 francs; eggs, 41,088,000, an increase of 7,611,000 francs; brown sugar, 39,298,000 francs, an increase of 9,393 francs. Butter alone shows a decrease, having declined from 69,969,000 francs in 1874 to 68,206,000 in 1875.

WOLVES IN FRANCE.—M. Buffet, minister of the interior, lately issued a circular to the prefects of several departments of France, reciting that complaints have reached the central government of the destruction of sheep by wolves in several quarters. In one case a farmer had lost 100 out of a flock of 397. The attention of the mayors was called to the laws authorizing the killing of destructive animals. The departmental officers are authorized to concert with forest-agents, and with lieutenants of wolf-hunting trains, arrangements for general battues. The object of the present circular is to arouse the zeal of the rural officials in a crusade against these enemies of the farmer, and to secure the immunity of sheep-husbandry.

FRENCH WHEAT CROPS.—The French minister of agriculture has authorized the publication of statistics in regard to the wheat-crops from 1815 to 1874. In 1820 the total production was 125,850,846 bushels, and the consumption 153,105,709, including the amount necessary for seeding at the rate of 2.64 bushels per acre. This left a deficiency of 27,254,863 bushels. In 1830 the production amounted to 149,786,827 bushels, and the consumption to 162,859,073 bushels, leaving a deficit of 12,072,246 bushels. In 1840 the production was 229,524,104 bushels, and the consumption 190,907,418 bushels, showing a surplus of 28,616,686 bushels. In 1850 the production amounted to 249,691,233 bushels, and the consumption to 221,711,270, a surplus of 27,979,763 bushels. In 1860 the production was 288,247,664 bushels, the consumption 241,985,945 bushels, and the surplus 46,261,719 bushels. In 1869 the production was 306,381,698 bushels, the consumption 274,252,689 bushels, and the surplus 32,066,009 bushels. In 1874 the production was 377,799,440 bushels, the consumption 269,235,158 bushels, and the surplus 108,564,282 bushels. These figures, however, do not coincide with the exports and imports of wheat in each of the years. In some cases a large surplus or a large deficit was left over, and its effect upon the markets was felt in the aggregates of the following years. The Franco-Prussian war in 1870 prevented the regular tabulation of agricultural statistics, and the figures of 1869 are given instead. Of fifty-three years in the period embraced in these statistics, forty years show an excess of production, and the following a deficit, viz: 1820, 1822, 1827, 1830,

1831, 1839, 1846, 1853, 1855, 1861, 1866, 1867, 1871, 1873. The exports exceeded the imports in 1833, 1834, 1835, 1836, 1837, 1838, 1840, 1841, 1848, 1849, 1850, 1851, 1852, 1858, 1859, 1860, 1864, 1865, and 1866. In the remaining years the imports exceeded the exports. Similar statistics in regard to other crops will soon be published by authority of the minister of agriculture.

CIDER FROM APPLES AND SUGAR-BEETS.—S. Paillart, a French farmer, gives the following details of the method of making cider, in France, with apples and sugar-beets mixed: To each hectoliter (2.83782 bushels) of apples, heaping measure, add 3 kilograms (6.614211 pounds) of red sugar-beets, the edible variety. The sugar-beets are first cut into pieces and then pressed with the apples. Pour into the vessel enough water to cover the pulp, and let it stand forty-eight hours; then subject the pulp to the action of the press. The pulp is then taken out, crumbed with the hands, replaced in the tub, and again covered with water for thirty-six hours, after which they are again pressed. This process is repeated two or three times. The cider is then placed in the cellar and not used till July or August, when the crude taste of the sugar-beet will have been eliminated. M. Paillart saved 200 francs in manufacturing 25 liquid hectoliters (each 26.4178 gallons) of cider in 1872, apples being at the rate of 10 francs per hectoliter, (dry measure.) In 1873 and 1874 the saving was but half as great.

A PRIZE-FARM IN NORMANDY.—At the late regional agricultural exhibition at Caen a premium was awarded to M. Cyrille Paynel, of the arrondissement of Lisieux, in the department of Calvados. M. Paynel works an estate of 196 hectares (481½ acres) in the valleys of the Vie and the Viette, divided into seven farms, for which he pays an aggregate annual rental of 42,000 francs. The farm-buildings are mostly situated upon the main farm and disposed in a large and nearly square area. The dwelling-house is on the east, and one of its large apartments at the north end has been appropriated to dairying. It is about 46 feet long and 17 feet wide, and is furnished along the walls and in the center with flag-stones laid in Portland cement, upon which, each day, may be cast 800 cheeses. The surface of these flags being inclined, the whey is drained through subterranean pipes into brick basins lined with Portland cement, outside the building. The water used in cleansing the flags and the pavement is also promptly drained, and every facility for perfect cleanliness is secured. A small car, invented by M. Paynel, gives easy transport to the milk-vessels. In the laundry adjoining the dairy a portable furnace furnishes hot water through pipes. Cold water is obtained through pipes from a brick basin containing over 100 gallons, supplied by a pump. To utilize as much as possible the surplus heat of the kitchen-fire, a small copper chamber, holding about 25 gallons, is built into the chimney and connected by pipes with the dairy. The drying-room, formerly a barn, is divided into four compartments: 1, the drying-room proper, in which straw, commonly used, is superseded by hurdles or sieves, of M. Paynel's invention, in which minute orifices through wire gauze give passage to air for drying; 2, the drying-cellar; 3, the finishing-cellar; 4, the packing and storing cellar.

On the west side of the area are two cider-presses with a reservoir of brick for fruit, containing about 14 hectoliters, or over 30 bushels. Another receptacle has been lately added so as to accommodate later fruit ripening before the early varieties have been ground into cider. The first reservoir is emptied in time to accommodate the latest ripening varieties, and thus the danger of rotting is mostly avoided.

On the south is a wagon shed; other buildings are ranged conveniently round the area. Behind the whole runs the little stream Viette, from which the farmer, by excavating about 200 cubic meters of earth, has secured a small pond, the surface of which is kept at a regulated level by means of a dam. A movable covered wash-house, by means of chains and pulleys, is kept at the surface of this pond. The area between the buildings is perfectly leveled.

About 48 hectares (118.56 acres) have been underdrained, with the happiest results; the drain-pipes vary from 3 to 6 feet deep, according to the depth and inclination of the clay substratum; the drains are from 22 to 100 feet apart, the intervals being mostly from 30 to 40 feet. The expense has ranged from 215 to 230 francs per hectare, or between \$16 and \$20 per acre.

Apple-trees, for cider, cover 23 hectares, or nearly 57 acres. Every four years the earth for half a yard around each tree is dug up and a cart-load of fresh rich earth deposited. During 15 years 1,064 apple-trees have been planted, each one being placed in a cubic meter of fresh earth deposited in the trench.

Meadows, properly so called, are not maintained on the estate. All the grass-lands are pastured up to the first week in May, when about 52 hectares (128½ acres) are reserved for mowing, and produce about 2,700 quintals (297½ tons) of hay. As the area mown is shifted each year, it covers the whole estate every three or four years. Rich earth from the river-bed is every summer scattered over the soil. Fermented manure is also freely dispensed during autumn, winter, and spring, a generous allotment being made to the young apple-trees. The manure is used in its fermenting stage in preference to well-rotted manure, because it is more active in its influence upon the soil, lasts longer, and, by aid of a slight covering of soil, may be made to cover three times as large a surface. Furthermore, the grass obtained from it is of good quality, succulent, better relished by milch-cows, and affords a richer quality of milk.

The live-stock maintained on the estate embraces 10 horses, 78 milch-cows, and 17 milch-cows of inferior character; 45 cows fattening for butchery, 20 calves and heifers equivalent to about 12 head of cattle, 30 beeves, and 12 hogs; total, 204 head. The milch-cows are of the *Augerone* and *Cotentine* varieties of the Norman breed. They are finely formed, in good condition, and admirably adapted to the soil upon which they graze. M. Paynel prefers the first variety, especially those from the banks of the Touques and the Dive, two small streams emptying into the English Channel. Milch-cows are kept to the number of 40 or 50 from May 1 to September 15, and from 70 to 100 during the remainder of the year. The farmer raises from 18 to 20 choice heifers each year, and two bull calves. The other calves are sold when over eight days old. In November he purchases 15 or 20 cows, milks them until June, and sends them to the Villette market. Thirty beeves of the *Cotentine* breed, and 50 cows either of Norman or of Mancelle blood, crossed with the Durham, complete the herd. The cattle remain in pasture all winter, and are fed hay part of the year. The average weight of cows fully fattened is 325 kilograms, or 716½ pounds. The number of cows is increased in the latter part of the season on account of the fabrication of Camembert cheese, which lasts from September to April. The cows are regularly milked three times per day, at 4½ a. m., noon, and 6 p. m. Each farm overseer is furnished with a memorandum, upon which he inscribes the day on which each cow was placed in pasture, as well as the date of her removal. This

method secures a perfect record of the number of head of cattle kept, and the number of days of each head.

The butter and cheese, except the Camembert cheese, is sold at Saint Pierre on the Dive. The Camembert cheese was originated at Camembert, in the department of Orne, by the great-grandmother of M. Paynel, and its fabrication has ever been maintained in his family. On three or four of his farms the milk, as soon as drawn, is brought carefully in a spring-wagon to the principal farm. The morning and noon milk is immediately subjected to the action of rennet and heated in proportion to the external temperature. Four or five liters of hot milk are generally sufficient to give 100 liters the required temperature. The evening milk is kept during the night and mingled with the milk of the following day. After about four hours the curd is placed by spoonfuls in the molds, an operation which is renewed about five times in seven or eight hours for the same cheese. As the milk drips through the molds, causing the surface to sink, the vacuum must be filled up at regular intervals by fresh supplies of curdled milk. The next day the cheese is turned over in the mold, and on the following day removed from it and salted. On the fifth day it is transported to the drying-room and placed on the hurdles or sieves before mentioned. They are kept here from twelve to thirty-six days, according to the dryness or humidity of the atmosphere, and are then deposited in the cellar for six to twenty days in addition. The Camembert cheese thus requires from twenty-five to sixty days, according to temperature, for its completion. The cheeses are then packed in rouleaux of six, in paper marked with the regular brand, and then surrounded by straw.

GERMAN AGRICULTURE.—In Germany, and especially in Eastern Prussia, the agricultural interest is suffering from the overproduction of alcohol and its consequent depreciation in the market. At the close of 1874 there was a surplus of 13,208,900 gallons, which continually augmented during 1875. To maintain this branch of production, the cultivation of potatoes during a few years past has been greatly enlarged, at the expense of grain-culture. This was followed by an enhanced import and a diminished export of rye, barley, oats, &c. Brandy distillation increased throughout the country, exceeding the wants of the community, while the foreign export trade afforded but a narrow margin of profit on account of high freight-charges, custom and excise duties, and foreign competition. A reaction has taken place in the minds of the German farmers in favor of grain production. The import of rye exceeded the export 7,000,000 quintals in 1872, 8,000,000 in 1873, and 12,000,000 in 1874. The excess of barley imports rose in three years from 1,700,000 quintals to 2,700,000; that of oats, from 670,000 to 2,900,000. A quintal (new measure) is equal to 220½ pounds.

HORSE-BREEDING IN GERMANY.—The late embargo upon the exportation of horses by the Prussian government has been rescinded under the growing pressure of complaints from horse-breeders, especially those of Hanover, Brandenburg, Saxony, and Silesia. In these provinces the business has been stimulated to such an extent that the home-market of Germany is not sufficient to absorb the annual production. Depots of stallions have been multiplied of later years, and also numerous depots for the purchase of army-horses have been established, in order to secure the choice of animals suited to the different arms of the service. These have generally been purchased at the age of three or four years, thus enabling the breeders to realize more speedily the returns for their care and labor in raising. The general demand is for horses of greater age.

This system has exercised a powerful influence upon the character of army-horses. At the close of 1873 the number of horses in the different provinces of the kingdom of Prussia was as follows: Prussia proper, 531,831; Silesia, 256,467; Brandenburg, 235,987; Posen, 194,000; Pomerania, 172,181; Saxony, 164,311; Rhine provinces, 134,256; Westphalia, 115,674; Hanover, 186,715; Schleswig-Holstein, 134,144; Hesse-Nassau, 65,225; total, 2,187,791.

In Prussia proper the number of horses is about 17 per cent. of the number of people; in Silesia, about $7\frac{1}{2}$ per cent.; Brandenburg, nearly 9 per cent.; Posen, $12\frac{1}{3}$ per cent.; Pomerania, 12 per cent.; Saxony, 8 per cent.; Rhine provinces, 4 per cent.; Westphalia, 6 per cent.; Hanover, 9 per cent.; Schleswig-Holstein, $13\frac{1}{2}$ per cent.; Hesse-Nassau, $4\frac{1}{2}$ per cent.; the whole kingdom, 9 per cent.

HUNGARIAN HORSES.—The Hungarians have ever been a nation of cavaliers, and the horse has enjoyed a grand rôle in their history. The brilliant success of the Magyars in beating back the invading hordes of Turks and Tartars has been especially due to their superiority in cavalry, and this is attributable to the admirable quality of their horses as well as to the high spirit of the riders. The Hungarian horse was originally of moderate stature, averaging a little less than fifteen hands high; head elegant and small, neck strong and not too long, good chest and back, hind-quarters sloping, legs excellent and terminated by very tough hoofs; color various. In the bracing climate and among the nutritious pastures of Hungary, the horse developed a hardy constitution, great power of endurance, with wonderful swiftness of movement. But subsequently, the original Scythian breed of Hungarian horses gave place in the great studs to imported animals, and is found to-day only among the peasantry of Hungary and among the Szekely of the Eastern Carpathians. Horses of large stature, Spanish, Roman, and Neapolitan, were sought, which, in some parts of the country, have resulted in a valuable breed. Subsequently, Danish horses were imported, and the large German horse was naturalized. The English horse has also been introduced, and has been growing in size, strength, and capacity. These different importations have resulted in great variations of breed and quality among Hungarian horses.

The total number of horses in Hungary is stated at 2,158,000, and the population at 15,417,000, making the number of horses 14 for every 100 people. This fact indicates the extent to which horse-breeding has been carried in Hungary. This branch of production has met with considerable obstruction in different ages; but, since the advent of Maria Theresa to the imperial throne of Austria, government has by subsidies and otherwise, assisted horse-breeders. Encouragements were given to the organization of studs, and prizes for excellence in horses were given. This governmental assistance has been extended and systematized. Stud's have been established by authority and distributed throughout the country. There are five stations in Alba Regia, with 570 stallions; six stations in Nagy Körös, with 870 stallions; four stations in Szepsi St. György, with 238 stallions; two stations in Varasd, with 122 stallions; total, sixteen stations, with 1,860 stallions.

A central commission, constituted of experts of the country, to secure the best and most productive system of horse-raising, meets at set periods every year. The statistics of each year's production are furnished by the minister of agriculture. This body corresponds with local commissions in each county, chosen by the horse-raisers and experts. These local committees are to communicate the actual condition of the busi-

ness to the central commission, and to diffuse among the agriculturists the latest information in regard to practical principles of horse-raising. They are also to award the prizes voted by the legislature, and to supervise the annual fairs at which horses are exhibited, and to regulate the service of the stallions, which during the breeding season are distributed at 525 local stations, and cover an average annually of 63,000 mares. The charges of service range from $2\frac{1}{2}$ to $37\frac{1}{2}$ francs for each mare.

THE EUCALYPTUS IN ALGERIA.—After successful plantings of this tree at Fondouk, Roniba, and Hussein-dey, in Algeria, its culture was commenced on a large scale in 1867. The first plantings have already produced wood that can be utilized in carpentry and wheelwrighting. Planks over 40 feet long have been cut, showing that after eight years of growth this tree will produce timber of great value and utility. A proprietor, on his own account and for other parties, has, since 1867, planted about 200,000 trees of this variety, and has already sold 50,000. The hygienic qualities of this tree, claimed by writers in other countries, do not appear to have been realized in Algeria. The plantations have had a remarkably thrifty growth, yet no diminution in the cases of malarial fever are noted. The wood is harder than that of any other species growing in that region, and its production promises great profit to the growers, meeting, as it does, a specific necessity of the people.

PRODUCTS OF SOUTH AUSTRALIA.—The lands of this colony are divided into three classes: First, the plains, mostly arable; second, the hill country, requiring more or less clearing, but of good soil; third, scrub lands, which will not pay for clearing. In Yorkes Peninsula and at other points is a class of table-lands, sprinkled with shea-oak and other small timber, which produces good wheat-crops. English and semi-tropical fruits here grow in great perfection.

About ninety thousand square miles are occupied by pastoral industry. The exports of wool during 1874-'75 were valued at £1,994,190, an increase of over 100 per cent. in ten years. These lands are mostly held under lease from the government at from 2s. 6d. to £1 per square mile, and an annual assessment of 2d. to 6d. per head for sheep and 1s. to 3s. per head for cattle. The pastoral lessees, called squatters, have ever been the pioneers of settled industry. Some of the earlier of these adventurers, who twenty years ago went out into the bush with a few horses, cattle, and sheep, are now immensely wealthy, while most of this class of enterprising settlers are in comfortable circumstances. In 1864 there were in the colony 4,106,230 sheep, which, in consequence of a severe drought in 1865, were reduced to three and three-quarters millions. In 1874 they numbered to 6,120,211 sheep. The increase in cattle has not been so great, and considerable numbers of fat stock are annually imported. The census of 1874 showed 93,122 horses and 185,342 cattle. The sheep and cattle are mostly reared on native grasses. Of late years the productiveness of the runs has greatly increased by fencing. About 18,000,000 acres have been inclosed, 2,000,000 during the last year. Race-horses have been produced to some extent, as the climate and other conditions are well calculated to produce sound animals of high nerve and spirit. Blooded stock has been introduced on a considerable scale.

The farmer follows close upon the heels of the shepherd squatter. The leases to the latter are subject at any time to revocation in order to be sold to regular farmers. Personal residence is not required, but no one is allowed to purchase over 640 acres; the land

must be occupied, if not by the purchaser himself, by a hired hand, who is to cultivate at least 20 per cent. of the land. After survey, the land is held for selection at £1 per acre. If there be more than one applicant for land, it is sold to the highest bidder. Installments of 10 per cent. of the purchase-money are required in cash, and at the end of three years; at the end of six years one-half the remainder of the purchase-money must be paid, and the remainder may continue on interest at 4 per cent. Improvements to the extent of 5s. per acre must be made before the close of the second year of occupation, and to the extent of 10s. per acre before the close of the fourth year. These improvements consist of dwelling and farm buildings, wells, water-tanks, fencing, draining, clearing, &c.

The method of wheat-growing is generally rude and unscientific. The ground is scratched to three or four inches deep, and the seed sown broadcast. If the seeding be not too late, the yield will be from 10 to 20 bushels per acre. Older lands show signs of exhaustion from continual cropping, without manure, from ten to thirty years. A year or two of fallow and stock-pasture partly restores the fertility. Red rust, locusts, hot winds, and a peculiar wheat malady, known as "take all," from its effective destruction of large patches of the crop, are the main difficulties in the way of the wheat-farmer. Of late years many small farmers have sold out in order to appropriate new land on the frontiers of the wilderness. The new line of settlements has reached from five to seventy miles inland from the coast, and as far as one hundred and sixty miles from Adelaide. The amount of land under cultivation has, in five years, increased from 959,000 acres to 1,330,484 acres, with large additions every year. Less than a fourth of these lands are under tillage, which is mostly directed to wheat-production. The crops gathered in December, 1874, from 839,638 acres, amounted to 9,862,000 bushels, or $11\frac{3}{4}$ bushels per acre. This shows an increase upon the previous year of 3,633,877, while the acreage increased only 54,000. Hay occupied 160,931 acres; barley, 13,724 acres; potatoes, 4,582 acres; permanent grasses, 27,076 acres; gardens, vineyards, and orchards, 7,334 acres. Flax was also found to do well in some localities. During the last ten years wheat-production has doubled, while population has increased only 30 per cent. Labor-saving machinery is used on an increasing scale, especially harvesters and reapers. South Australian wheat is of high quality, as is shown not only by prizes at late European expositions, but also by the fact that Victoria and New Zealand, though producing a surplus for export, import South Australian wheat to mix with and give character to their own product.

The rich chocolate loam of the hill-sides produces excellent grapes, and most of the best varieties of France and Spain have been introduced. The vineyards already cover 5,051 acres, yielding at the last vintage 648,186 gallons of wine, most of which is consumed in the colony. Some brands secured prizes at the London, Paris, and Vienna expositions. The Sultana and Muscatel yield several tons of raisins per annum. Orange-culture has been successfully inaugurated. Fruits and melons of delicious quality have been grown. The olive thrives on this soil, and, for several years, a thriving trade in oil has been prosecuted. It commands 10s. per gallon, and is regarded as fully equal to the imported article. Mulberry-trees are being extensively planted under bounties from government to encourage silk-production, for which the climate is supposed to be well fitted. Sugar-beet and other roots have been introduced. Tobacco thrives, though with but little attention hitherto.

A vast region in the northern part of the colony awaits occupation, and presents characters of soil and climate very eligible for future settlement. Gold-mining has been prosecuted on a small scale, but not with very encouraging results. Silver-mining has paid better. Iron-ores of great richness and purity are found in some parts of the colony, and lately a few tons of pig-iron have been produced. Several branches of general manufacture have been started on a large scale. Since 1838 the total imports of the colony amounted to \$277,199,170 and the exports to \$262,965,430.

QUEENSLAND AT THE CENTENNIAL.—This Australian colony, which has had heretofore the enterprise to be represented in intercolonial exhibitions at Sydney and Melbourne, and in international, at London and Vienna, has taken measures to participate in our Centennial. The government has appropriated for this purpose \$15,000, and appointed two commissioners—the one to make known what there is in Queensland which may benefit the United States, and the other to learn what there is in the United States which may benefit Queensland. The former is Mr. Daintree, general agent of the colony in England. In carrying out the general idea of showing what Queensland has produced, and what more it is capable of producing, he is expected to take advantage of a collection of its products now in London, and to direct special effort toward exhibiting such raw materials as the colony produces for export. Among these are specified wool, sugar, pure spirit, timber, tin, copper, coal, and the precious metals. The commissioner for gaining information is Mr. Angus Mackay, a leading editor in the colony. His mission is not limited to the exhibition at Philadelphia, but contemplates researches in the States and Territories, with a view to learn the most successful measures for the settlement and development of new territory, and the most advanced processes and machinery (as seen, not on exhibition, but in practical operation) in agriculture, mining, manufactures, and the mechanic arts.

MARKET-PRICES OF FARM-PRODUCTS FOR FEBRUARY, MARCH, AND APRIL, 1876.

The following quotations represent, as nearly as practicable, the state of the market at the opening of each month.

Articles.	February.	March.	April.
NEW YORK.			
Flour, superfine, State and western....per bbl..	\$4 25 to \$4 60	\$4 25 to \$4 60	\$4 50 to \$4 75
extra State.....do.	4 85 to 5 90	4 90 to 5 60	5 10 to 5 65
extra to choice western.....do.	4 85 to 9 00	4 90 to 9 00	5 10 to 9 00
common to choice southern shipping extras.....per bbl.	4 80 to 6 30	4 80 to 6 25	5 25 to 6 45
common to choice southern family brands, per barrel.....	6 40 to 8 75	6 30 to 8 75	6 50 to 8 75
Wheat, No. 1 spring.....per bush..	1 31 to 1 33	1 33 to 1 37	1 34 to 1 39
No. 2 spring.....do.	1 19 to 1 21	1 24 to 1 27	1 22 to 1 29
winter, red, western.....do.	1 18 to 1 47	1 22 to 1 47	1 15 to 1 47
winter, amber, western.....do.	1 18 to 1 47	1 22 to 1 47	1 15 to 1 47
winter, white, western.....do.	1 35 to 1 55	1 35 to 1 50	1 36 to 1 50
Corn.....do.	57½ to 65½	60 to 70	65 to 68
Oats.....do.	44 to 51½	45½ to 53	42 to 50
Rye.....do.	86 to 89	82 to 88	86 to 97
Barley.....do.	84 to 1 18	85 to 1 25	— to 1 08
Hay, baled, first quality for retail.....per ton..	21 00 to 23 00	18 00 to 21 00	18 00 to 21 00
second quality for shipping.....do.	17 00 to —	15 00 to 16 00	15 00 to 16 00

Market-prices of farm-products—Continued.

Articles.	February.	March.	April.
NEW YORK—Continued.			
Beef, mess.....per bbl.	\$10 50 to \$11 50	\$10 50 to \$12 00	\$12 50 to \$13 00
extra mess.....do.	12 00 to 12 50	12 50 to 13 50	12 50 to 13 50
Pork, mess.....do.	21 25 to —	22 65 to 22 80	23 20 to 23 25
extra mess.....do.	16 00 to —	18 50 to —	— to —
prime mess.....do.	19 75 to 22 00	20 50 to 21 50	— to 21 50
Lard.....per lb.	12½ to 13½	13½ to 13½	14½ to 14½
Butter, western.....do.	16 to 34	16 to 36	17 to 35
State dairy.....do.	26 to 36	24 to 38	32 to 43
Cheese, State factory.....do.	07 to 13½	07 to 14	07 to 13½
western factory.....do.	06 to 12½	06 to 13	07 to 13
Sugar, fair to prime refining.....do.	7½ to 08½	07½ to 07½	07½ to 07½
Cotton, ordinary to good ordinary.....do.	09½ to 11½	09 to 10½	9½ to 11½
low middling to good middling.....do.	12½ to 13½	11½ to 13½	12½ to 14½
Tobacco, lugs.....do.	06 to 09	05 to 09½	04½ to 07
leaf.....do.	08½ to 12	08 to 12	07 to 10½
Wool, American XXX and picklock.....do.	50 to 54	50 to 54	45 to 55
American X and XX.....do.	43 to 48	43 to 48	38 to 46
American, combing.....do.	55 to 65	55 to 65	48 to 57
pulled.....do.	27 to 44	27 to 44	25 to 42
California spring clip.....do.	18 to 32	18 to 32	17 to 30
California fall clip.....do.	15 to 21	15 to 21	13 to 23
BOSTON.			
Flour, western superfine spring.....per bbl.	4 00 to 4 50	4 00 to 4 25	4 00 to 4 50
common spring extras.....do.	4 75 to 5 50	4 75 to 5 25	5 00 to 5 50
good to fancy northwestern spring.....do.	5 00 to 9 25	5 00 to 9 25	5 50 to 9 50
good to fancy western winter.....do.	6 00 to 9 00	6 00 to 9 00	6 00 to 9 00
southern family.....do.	6 50 to 9 00	6 50 to 9 00	6 50 to 9 00
Wheat.....per bush.	1 00 to 1 50	1 06 to 1 55	1 05 to 1 55
Corn.....do.	64½ to 66½	65 to 68	72 to 75
Oats.....do.	43 to 57	43 to 55	44 to 56
Rye.....do.	95 to 1 00	95 to 1 00	90 to 95
Barley.....do.	90 to 1 30	85 to 1 20	85 to 1 20
Hay, eastern and northern.....per ton.	20 00 to 21 00	13 00 to 20 00	15 00 to 21 00
Beef, mess.....per bbl.	12 00 to 12 50	12 00 to 12 50	12 00 to 12 50
extra mess.....do.	13 00 to 13 50	13 00 to 13 50	13 00 to 13 50
family.....do.	16 50 to 17 00	16 50 to 17 00	16 50 to 17 00
Pork, prime.....do.	15 00 to 16 00	18 00 to 18 50	19 00 to 20 00
mess.....do.	21 50 to 22 00	23 00 to 23 50	23 75 to 24 00
Lard.....per lb.	13½ to 14	13½ to 14½	14½ to 15
Butter, New York and Vermont.....do.	20 to 33	20 to 34	30 to 38
western.....do.	18 to 33	18 to 29	22 to 30
Cheese, New York and Vermont factory.....do.	10 to 13	10 to 13½	10 to 14
western factory.....do.	— to —	9 to 13½	9 to 13½
Sugar, fair to good refining.....do.	8 to 12½	7½ to 7½	7½ to 7½
Cotton, ordinary to good ordinary.....do.	9½ to 11½	8½ to 10½	9½ to 11½
low middling to good middling.....do.	12½ to 14	12 to 13½	12½ to 14½
Wool, Ohio and Pennsylvania.....do.	45 to 50	38 to 52½	42 to 47
Michigan.....do.	42 to 45	42 to 46	40 to 41
other western.....do.	42 to —	— to —	— to —
pulled.....do.	35 to 55	35 to 47	30 to 48
combing fleece.....do.	52 to 60	42 to 65	— to —
California.....do.	17 to 34	14 to 33	14 to 32
PHILADELPHIA.			
Flour, superfine.....per bbl.	4 00 to 4 25	3 50 to 4 00	3 50 to 4 00
Pennsylvania, extra to choice.....do.	4 25 to 6 50	4 25 to 6 50	4 25 to 6 75
western, extra to choice.....do.	4 25 to 6 75	4 25 to 6 60	5 75 to 8 00
Wheat, white.....per bush.	1 45 to 1 55	1 45 to 1 55	1 50 to 1 58
amber.....do.	1 41 to 1 42	1 41 to 1 43½	— to 1 53
red.....do.	1 20 to 1 40	1 20 to 1 40	95 to 1 52
Rye.....do.	86 to 88	83 to 84	81 to 82
Barley.....do.	75 to 1 35	75 to 1 30	75 to 1 25
Corn.....do.	52 to 60	54 to 61	60 to 65½
Oats.....do.	40 to 48	38 to 48	43 to 50
Hay, baled, prime.....per ton.	21 00 to 21 50	21 00 to 21 50	21 00 to 21 50
common to fair shipping.....do.	19 00 to 20 00	19 00 to 20 00	19 00 to 20 00
Beef, western mess.....per bbl.	7 00 to 9 00	7 00 to 9 00	9 00 to 10 00
extra mess.....do.	8 00 to 9 00	8 00 to 9 00	11 50 to 12 50
Wartman's city family.....do.	16 00 to —	16 00 to —	23 00 to 23 75
Pork, mess.....do.	21 25 to 21 50	22 50 to 23 00	23 50 to 24 75
prime mess.....do.	20 00 to —	21 00 to —	21 00 to —
prime.....do.	17 00 to 18 00	18 00 to 19 50	18 75 to 19 00
Lard.....per lb.	12 to 13	13 to 13½	14½ to 15
Butter, choice Middle States.....do.	28 to 38	27 to 38	36 to 44
choice western.....do.	25 to 31	25 to 31	23 to 43
Cheese, New York factory.....do.	11½ to 13½	11½ to 14	5 to 14
Ohio factory.....do.	— to 13	— to 13	4 to 13½

Market-prices of farm-products—Continued.

Articles.	February.	March.	April.
PHILADELPHIA—Continued.			
Sugar, fair to good refining..... per lb..	\$0 07½ to \$0 08	\$0 07½ to \$0 07½	\$0 07½ to \$0 07
Cotton, ordinary to good ordinary..... do..	9½ to 11½	9 to 10½	9½ to 11½
low middling to good middling..... do..	12½ to 13½	12 to 12½	12½ to 14
Wool, Ohio and Pennsylvania, X to XXX. do..	47 to 50	48 to 52½	45 to 48
other western..... do..	24 to 42	40 to 45	40 to 45
tub-washed..... do..	40 to 54	40 to 52½	40 to 52
pulled..... do..	42 to 64	38 to 64	26 to 64
combing..... do..	44 to 62	— to 66	42 to 65
BALTIMORE.			
Flour, superfine..... per bbl..	3 75 to 4 50	3 75 to 4 50	3 75 to 4 25
extra..... do..	4 75 to 6 75	4 75 to 7 00	4 75 to 7 50
family..... do..	5 75 to 8 75	5 25 to 8 75	5 75 to 9 00
Wheat, red..... per bush..	1 18 to 1 45	1 15 to 1 45	1 45 to 1 50
amber..... do..	— to 1 55	— to 1 55	1 60 to 1 62
white..... do..	— to 1 45	— to 1 45	1 40 to 1 60
Rye..... do..	73 to 80	78 to 82	80 to 83
Oats..... do..	43 to 50	40 to 47	40 to 49
Corn..... do..	55 to 62	53 to 59	59 to 61
Hay, Maryland and Pennsylvania..... per ton..	18 00 to 24 00	18 00 to 24 00	18 00 to 24 00
western..... do..	18 00 to 20 00	— to —	17 00 to 19 00
Pork, mess..... per bbl..	21 25 to 21 50	22 75 to 23 00	23 00 to 23 50
extra prime..... do..	— to —	17 25 to —	18 00 to —
Lard..... per lb..	12½ to 13½	13½ to 14	14½ to 14
Butter, western..... do..	17 to 26	18 to 26	18 to 41½
eastern..... do..	18 to 33	17 to 35	16 to 43
Cheese, western factory..... do..	11 to 12½	11 to 13½	12½ to 14
eastern factory..... do..	12 to 13½	12½ to 14½	11½ to 13½
Sugar, fair to good refining..... do..	7½ to 8½	7½ to 7½	7½ to 7½
New Orleans grocery grades..... do..	7½ to 8½	7½ to 8½	— to —
Tobacco, lugs..... do..	6½ to 9	6½ to 9	6½ to 11
leaf, common to medium..... do..	9 to 11	9 to 11	9 to 14
Cotton, ordinary to good ordinary..... do..	8½ to 10½	8½ to 10½	9½ to 11½
low middling to good middling..... do..	12 to 13	11½ to 12½	12½ to 13½
CINCINNATI.			
Flour, superfine..... per bbl..	3 50 to 3 85	3 50 to 3 75	3 50 to 3 90
extra..... do..	4 35 to 4 75	4 25 to 4 60	4 00 to 4 60
family and fancy..... do..	5 15 to 8 00	5 00 to 8 00	4 90 to 7 50
Wheat, winter, red..... per bush..	1 15 to 1 37	1 12 to 1 30	1 15 to 1 35
hill, (amber)..... do..	— to —	1 25 to 1 35	— to 1 32
white..... do..	1 40 to 1 45	1 40 to 1 45	1 38 to 1 48
Rye..... do..	65 to 80	70 to 78	73 to —
Barley..... do..	50 to 1 15	40 to 1 15	95 to 1 23
Corn..... do..	39 to 44	44 to 46	49 to 51
Oats..... do..	36 to 43	30 to 40	33 to 43
Hay, baled, No. 1..... per ton..	15 00 to 17 00	15 00 to 18 00	15 00 to 18 00
lower grades..... do..	8 00 to 14 00	8 00 to 14 00	6 00 to 10 00
Pork, mess..... per bbl..	20 50 to —	22 25 to 22 45	23 00 to —
Lard..... per lb..	12½ to 13½	12½ to 13½	13½ to 14
Butter, choice..... do..	26 to 30	27 to 30	33 to 35
prime..... do..	22 to 25	25 to 27	— to 30
Cheese, prime to choice..... do..	12 to 13	12 to 13	13 to 13½
Sugar, New Orleans, fair to good..... do..	7½ to 8½	7½ to 8½	7½ to 8½
prime..... do..	8½ to 9	8½ to 9	8½ to 9
Tobacco, lugs..... Per lb..	15 to 20	— to —	— to —
leaf..... do..	28 to 30	— to —	— to —
Cotton, ordinary to good ordinary..... do..	8½ to 10	8 to 9½	9 to 10½
low middling to good middling..... do..	11½ to 13	11 to 12½	11½ to 13½
Wool, fleece, common to fine..... do..	38 to 43	38 to 43	38 to 43
tub-washed..... do..	43 to 48	43 to 48	43 to 48
unwashed, clothing..... do..	25 to 30	25 to 30	28 to 30
combing..... do..	34 to 38	34 to 38	34 to 38
pulled..... do..	31 to 37	31 to 37	35 to 37
CHICAGO.			
Flour, choice winter extras..... per bbl..	6 50 to 7 50	6 50 to 7 50	6 50 to 7 50
common to good winter extras..... do..	4 75 to 5 50	4 75 to 5 50	4 75 to 5 50
spring extras, common to good..... do..	4 00 to 4 75	4 00 to 4 75	4 00 to 4 90
choice spring extras..... do..	5 00 to 5 25	5 00 to 5 25	5 00 to 5 25
patent spring..... do..	6 50 to 7 25	6 50 to 7 25	6 50 to 7 25
spring superfines..... do..	3 00 to 3 50	3 00 to 3 50	3 00 to 3 50
Wheat, No. 1 spring..... per bush..	Nominal.....	Nominal.....	Nominal.....
No. 2 spring..... do..	97½ to 98	97½ to 98	10½ to 10½
No. 3 spring..... do..	76 to 77½	80 to 82	82½ to 90
Rye, No. 2..... do..	67 to 67½	61 to 62	64 to 65

Market-prices of farm-products—Continued.

Articles.	February.	March.	April.
CHICAGO—Continued.			
Barley, No. 2.....per bush..	\$0 75 to \$0 76	\$0 51½ to \$0 53	\$0 60 to —
Corn, No. 2.....do.....	40½ to 40½	41½ to 42	46 to \$0 47½
Oats, No. 2.....do.....	30½ to 30½	31½ to 31½	33½ to 33½
Hay, timothy.....per ton..	11 50 to 14 00	10 00 to 12 00	11 50 to 13 00
prairie.....do.....	7 00 to 9 00	6 00 to 9 00	8 00 to 11 50
Beef, mess.....per bbl..	9 50 to 10 00	8 50 to 9 00	10 50 to 11 00
extra mess.....do.....	10 50 to 11 00	9 50 to 10 00	11 50 to 12 00
Pork, mess.....do.....	19 50 to —	21 65 to 21 67½	22 35 to —
prime mess.....do.....	17 75 to —	19 00 to —	22 00 to —
extra prime.....do.....	14 50 to 14 75	16 00 to —	17 00 to —
Lard.....per lb..	12 to 12½	12½ to 13	14 to —
Butter, choice to fancy.....do.....	26 to 32	27 to 33	35 to 40
medium to good.....do.....	18 to 23	20 to 34	25 to 30
Cheese, good to choice factory.....do.....	12½ to 13½	12½ to 13½	12 to 13
Sugar, New Orleans, common to prime.....do.....	7 to 8½	7 to 8½	7 to 8½
Wool, tub-washed.....do.....	44 to 53	44 to 53	44 to 53
fleece-washed.....do.....	39 to 43	39 to 43	40 to 44
unwashed.....do.....	25 to 33	25 to 33	25 to 33
pulled.....do.....	33 to 36	33 to 36	30 to 40
SAINT LOUIS.			
Flour, winter, common to choice.....per bbl..	4 00 to 7 50	4 00 to 7 50	3 50 to 7 50
spring.....do.....	— to —	— to —	— to —
Wheat, white winter.....per bush..	1 00 to 1 30	1 00 to 1 30	1 00 to 1 35
red winter.....do.....	1 03 to 1 60	1 00 to 1 55	1 03 to 1 52
spring.....do.....	— to —	— to —	— to —
Corn.....do.....	35 to 41	37 to 43	41 to 46
Rye.....do.....	60 to 68	50 to 70	50 to 70
Barley, fair to choice.....do.....	80 to 1 30	30 to 1 25	70 to 1 15
Oats.....do.....	32 to 39	32 to 38	31 to 37
Hay, timothy.....per ton..	14 50 to 17 50	14 50 to 17 50	14 50 to 18 50
prairie.....do.....	7 00 to 10 00	7 00 to 10 00	7 00 to 10 00
Beef, mess.....per bbl..	14 00 to 14 50	14 00 to 14 50	14 00 to 14 50
Pork, mess.....do.....	19 50 to 20 00	22 25 to 22 50	23 00 to 23 50
Lard.....per lb..	11½ to 13	13½ to 14	11½ to 13
Butter, prime to choice dairy.....do.....	25 to 30	25 to 30	30 to 35
country-packed.....do.....	16 to 18	18 to 22	25 to 30
Cheese, Ohio factory.....do.....	12½ to 13½	12½ to 13½	12½ to 13½
New York factory.....do.....	13 to 14	13 to 14	13 to 14
Wool, tub-washed.....do.....	44 to 46	44 to 46	47 to 48½
fleece-washed.....do.....	38 to 42	38 to 42	38 to 42
unwashed.....do.....	30 to 34	30 to 34	30 to 34
NEW ORLEANS.			
Flour, superfine.....per bbl..	3 75 to —	4 00 to —	4 00 to —
extra.....do.....	4 00 to 5 25	4 25 to 5 50	4 25 to 5 50
choice to fancy.....do.....	5 50 to 7 25	5 75 to 7 15	5 75 to 7 50
Corn, white and yellow.....per bush..	52 to 53	53 to 58	55 to 60
Oats.....do.....	45 to 49	40 to 45	42 to 45
Hay, choice.....per ton..	22 00 to —	25 00 to —	20 00 to —
prairie.....do.....	16 00 to 18 00	17 00 to 18 00	14 50 to 16 00
Beef, Kansas.....per bbl..	12 00 to 12 50	12 00 to —	— to —
Texas.....do.....	— to —	12 00 to —	12 00 to 12 50
western.....do.....	15 00 to 17 00	15 00 to 16 00	12 00 to 16 00
Fulton market.....per half-bbl..	11 50 to —	11 50 to —	11 75 to 12 00
Pork, mess.....per bbl..	21 50 to 22 00	23 00 to 23 75	24 00 to 24 50
Lard.....per lb..	12½ to 14	13½ to 14½	14½ to 15½
Butter, choice Goshen.....do.....	33 to 35	33 to 35	40 to 42
choice western.....do.....	25 to 27	25 to 28	30 to —
Cheese, choice western factory.....do.....	12½ to 13	13 to —	12½ to —
New York cream.....do.....	14½ to 15	14½ to 15	14 to —
Sugar, fair to fully fair.....do.....	6 to 7	6 to 7	7½ to 7½
prime to strictly prime.....do.....	7½ to 7½	7½ to 7½	7½ to 7½
clarified, white, and yellow.....do.....	8½ to 9	8 to 9	9 to 10
Cotton, ordinary to good ordinary.....do.....	8½ to 10	8 to 9	9 to 10½
low middling to good middling.....do.....	11 to 13½	10½ to 13½	11½ to 14½
Tobacco, lugs.....do.....	6 to 8	5½ to 7	5½ to 7
low leaf to medium leaf.....do.....	9 to 14	8 to 10½	8 to 10½
SAN FRANCISCO.			
Flour, superfine.....per bbl..	4 50 to 5 00	4 50 to 5 00	4 25 to 5 00
extra.....do.....	5 25 to 5 50	5 25 to 5 50	5 25 to 5 50
family and fancy.....do.....	5 75 to 6 00	5 75 to 6 00	5 75 to 6 00
Wheat, California.....per cental..	1 75 to 1 95	1 75 to 1 95	1 75 to 2 00
Oregon.....do.....	1 75 to 1 95	1 75 to 1 90	1 75 to 2 00
Barley.....do.....	1 20 to 1 35	1 20 to 1 35	1 15 to 1 35

Market-prices of farm products—Continued.

Articles.	February.	March.	April.
SAN FRANCISCO—Continued.			
Oats.....per cental..	\$2 05 to \$2 35	\$2 05 to \$2 25	\$2 10 to \$2 50
Corn.....do.....	1 25 to 1 35	1 15 to 1 25	1 15 to 1 25
Hay, state.....do.....	13 00 to 18 50	12 00 to 18 00	14 00 to 18 50
Pork, mess.....per bbl..	22 00 to 23 00	22 00 to 23 00	22 00 to 23 00
prime mess.....do.....	17 50 to 18 00	17 50 to 18 00	17 50 to 18 00
Beef, mess.....do.....	8 50 to 10 00	8 50 to 10 00	8 50 to 10 00
family mess.....per half-bbl.	8 00 to 10 00	8 00 to 10 00	8 00 to 10 00
Lard.....per lb.....	13 to 15	13 to 15	13½ to 15
Butter, overland.....do.....	18 to 25	18 to 25	16 to 18
California.....do.....	25 to 30	25 to 30	25 to 30
Oregon.....do.....	20 to 22½	20 to 22½	20 to 22½
Cheese.....do.....	12½ to 15	12½ to 15	12½ to 15
Wool, native.....do.....	10 to 15	10 to 15	10 to 15
California.....do.....	15 to 19	15 to 19	15 to 18
Oregon.....do.....	18 to 20	18 to 20	16 to 18

LIVE-STOCK MARKETS.

NEW YORK.			
Cattle, extra beeves.....per cental..	— to 11 50	11 50 to 12 75	11 75 to 12 00
good to prime.....do.....	— to 11 00	— to 11 50	— to 11 50
common to fair.....do.....	8 00 to 10 00	9 00 to —	9 00 to —
Texans.....do.....	— to —	— to —	— to —
milch-cows.....per head..	50 00 to 85 00	— to —	— to —
veal-calves.....per cental..	7 00 to 10 50	7 00 to 10 50	— to —
Sheep.....do.....	5 50 to 7 37	5 35 to 7 37	6 75 to 7 87
Swine.....do.....	8 50 to 10 50	10 12½ to 10 50	10 25 to 10 75
PHILADELPHIA.			
Cattle, prime beeves.....per cental..	7 12½ to 7 50	7 12½ to 7 25	7 00 to 7 75
fair to good.....do.....	5 50 to 7 00	5 50 to 7 00	5 75 to 6 75
common.....do.....	4 00 to 5 25	4 00 to 5 25	4 50 to 5 50
Sheep.....do.....	5 75 to 7 00	4 50 to 7 00	5 00 to 7 75
Swine, corn-fed.....do.....	10 00 to 11 50	11 50 to 12 50	12 50 to 13 75
BALTIMORE.			
Cattle, best beeves.....per cental..	5 87 to 6 50	5 75 to 6 37½	6 12 to 6 50
first quality.....do.....	4 75 to 5 75	4 75 to 5 75	5 12 to 6 12
medium or good quality.....do.....	3 75 to 4 75	4 25 to 4 75	4 50 to 5 12
ordinary.....do.....	3 00 to 3 50	3 00 to 4 00	3 50 to 4 00
general average of the market.....do.....	4 50 to —	4 87½ to —	5 37 to —
most of the sales.....do.....	4 00 to 5 25	4 37½ to 5 25	4 75 to 5 87
milch-cows.....do.....	— to —	— to —	— to —
Sheep.....do.....	4 50 to 6 50	4 50 to 7 50	5 00 to 7 50
Swine.....do.....	9 50 to 10 50	10 75 to 12 00	10 50 to 12 00
CINCINNATI.			
Cattle, good to prime, butchers' steers, per cental..	5 00 to 5 50	4 75 to 5 00	4 75 to 5 25
fair to medium.....per cental..	4 00 to 4 75	3 50 to 4 50	3 75 to 4 50
common.....do.....	2 75 to 3 75	2 75 to 3 25	3 00 to 3 50
milch-cows.....do.....	— to —	— to —	— to —
veal-calves.....do.....	— to —	— to —	— to —
Sheep.....do.....	3 25 to 6 00	3 75 to 6 00	4 00 to 6 00
Swine.....do.....	7 40 to 8 35	7 40 to 8 35	7 25 to 8 60
CHICAGO.			
Cattle, extra graded steers.....per cental..	— to 6 50	— to —	— to —
choice beeves.....do.....	5 00 to 5 50	5 00 to 5 50	5 00 to 5 50
good beeves.....do.....	4 35 to 4 75	4 00 to 4 75	4 40 to 4 80
medium.....do.....	4 12½ to 4 25	3 50 to 3 75	4 20 to 4 40
inferior natives.....do.....	2 80 to 4 00	3 00 to 3 50	2 50 to 3 50
Texan.....do.....	— to —	— to —	— to —
Sheep.....do.....	4 00 to 5 50	4 00 to 6 00	4 50 to 7 75
Swine.....do.....	7 25 to 7 80	7 50 to 8 30	8 00 to 8 75

Live-stock markets—Continued.

Articles.	February.	March.	April.
SAINT LOUIS.			
Cattle, good to choice native steers...per cental..	\$5 25 to \$6 00	\$5 25 to \$5 50	\$5 25 to \$5 50
common to fair natives.....do.....	3 00 to 4 25	3 00 to 4 25	3 00 to 4 25
inferior to common.....do.....	2 00 to 3 25	2 00 to 3 25	2 00 to 3 25
Texan, fair to choice.....do.....	3 00 to 4 25	3 00 to 4 50	3 00 to 4 50
Sheep.....do.....	2 75 to 5 50	2 75 to 5 50	2 75 to 5 50
Swine.....do.....	5 75 to 7 25	7 40 to 8 10	7 50 to 8 50
Horses, plugs.....per head.....	30 00 to 40 00	30 00 to 50 00	30 00 to 50 00
plain.....do.....	60 00 to 75 00	60 00 to 75 00	60 00 to 75 00
street-car.....do.....	75 00 to 125 00	75 00 to 125 00	75 00 to 125 00
heavy draught.....do.....	115 00 to 125 00	115 00 to 125 00	115 00 to 125 00
good drivers.....do.....	100 00 to 150 00	100 00 to 150 00	100 00 to 150 00
extra.....do.....	175 00 to 200 00	175 00 to 200 00	175 00 to 200 00
auction horses and ponies.....do.....	25 00 to 45 00	25 00 to 45 00	25 00 to 45 00
Mules, 14 to 15 hands high.....do.....	80 00 to 130 00	80 00 to 130 00	80 00 to 120 00
15 to 16 hands high.....do.....	130 00 to 170 00	130 00 to 170 00	115 00 to 170 00
extra.....do.....	175 00 to 200 00	175 00 to 200 00	— — to — —
NEW ORLEANS.			
Cattle, Texas beeves, choice.....per head..	— — to 40 00	— — to 40 00	— — to 40 00
first quality.....do.....	30 00 to 35 00	— — to 35 00	— — to 35 00
second quality.....do.....	20 00 to 25 00	— — to 30 00	— — to 30 00
western beeves.....per cental.....	— — to — —	4 00 to 5 00	4 00 to 5 50
milch-cows.....per head.....	40 00 to 90 00	40 00 to 90 00	70 00 to 90 00
Sheep.....do.....	2 00 to 6 00	2 00 to 6 00	2 00 to 6 00
Swine.....per cental.....	6 00 to 8 00	6 00 to 8 50	6 00 to 8 50
Horses, good combined.....per head.....	150 00 to 200 00	150 00 to 200 00	— — to — —
plugs.....do.....	100 00 to 150 00	100 00 to 150 00	— — to — —
common.....do.....	40 00 to 80 00	40 00 to 80 00	— — to — —
Mules, well-broken, first-class.....do.....	225 00 to 275 00	225 00 to 275 00	— — to — —
second-class.....do.....	175 00 to 225 00	175 00 to 225 00	— — to — —

FOREIGN MARKETS.

WHEAT.—Considerable uneasiness was created in England by the long continuance of rain at a time when drying winds were most needed and usually looked for. The conditions of growth at the close of March had become more favorable, but still there was anxiety lest the long continuance of wet weather in spring should greatly retard the harvest. Spring sowings are generally completed by the middle of March, and any postponement necessitated by bad weather causes apprehension in regard to spring-grain, postponing its ripening beyond its normal season. The approach of warm weather, it was hoped, would enable winter-wheat to recover from the check which had been given to vegetation in general. France and Germany complain still more loudly of severe weather accompanied by destructive inundations. These adverse influences have caused a rise in prices, inasmuch as they betoken a decreased European crop. Buyers are operating with greater confidence, while sellers are becoming less anxious to push their stocks upon the market. This improvement in prices is general through Europe, especially in the metropolitan and larger principal markets. In London a considerable trade in low-priced Indian, American, and Russian wheats for export had sprung up. Good inquiry was reported at Odessa for continental shipment. English leading markets, at the close of March, were but scantily supplied with native wheat, and prices had advanced at rates varying from 2s. to 4s. per quarter. The sales of English wheat during the week ending March 25 amounted to 45,047 quarters, at 42s. 9d. per quarter against 67,153 quarters, at 41s. 9d., during the corresponding week of 1875. The London averages were 44s. 4d. on 2,375 quarters.

The imports into the United Kingdom during the week ending March 18 were 467,681 cwts. In Mark Lane, London, Essex, and Kent, white brought 40s. to 52s. per quarter; ditto, red, 38s. to 47s.; Norfolk, Lincolnshire, and Yorkshire, 41s. to 50s. Of foreign wheats, Dantzic, mixed, was quoted at 50s.@55s.; Königsberg, 49s.@54s.; Rostock, 50s.@53s.; Pomeranian, Mecklenberg, and Uckermark, red, 46s.@49s.; Ghirka, 42s.@48s.; Russian hard, 45s.@47s.; Saxonska, 46s.@50s.; Danish and Holstein, red, 46s.@49s.; American, red, 45s.@54s.; Chilian, white, 51s.; Californian, 51s.; Australian, 52s.@54s.

At Liverpool, British white brought 9s. 9d. to 10s. 2d. per cental; ditto, red, 9s. 5d. to 9s. 10d.; Canadian, white, 10s. 2d. to 10s. 6d.; red club and golden drop, 9s. 9d. to 10s. 2d.; American, white, 10s. 4d. to 10s. 6d.; ditto, red winter, 8s. 2d. to 10s. 8d.; No. 1, Minnesota, 9s. 9d. to 10s. 2d.; spring, No. 1, 9s. 8d. to 10s.; No. 2, 8s. 9d. to 9s. 10d.; French, 9s. 4d. to 9s. 7d.; Indian, 8s. to 9s. 9d.; Egyptian, 7s. 6d. to 9s. 6d.; Californian, 10s. 3d. to 11s.; Oregon, 10s. 9d. to 11s.; Australian, 10s. 9d. to 11s. In France the average of the regional markets, as stated March 23, was 23.53 francs per quintal, a rise of 0.26 franc from the previous week.

FLOUR.—Flour has sympathized with wheat in buoyancy of prices. The imports into the United Kingdom during the week ending March 18 were 76,869 cwts., against 120,645 cwts. the week previous. In Mark Lane the best town-households bring 38s.@47s. per sack of 280 pounds; the best country-households, 33s.@36s.; Norfolk and Suffolk, old, 28s.@30s. The only foreign wheat quoted by our authority in this market is the American, 24s.@27s. per barrel of 196 pounds. In Liverpool, English and Irish superfines, 36s.@38s. per 280 pounds; extra, 39s.@41s.; French, 39s.@46s. 6d.; Trieste, 50s.@56s.; Chilian, 34s.@35s.; Californian, 36s.@38s.; American, western and extra State, 23s.@25s. per barrel; Baltimore and Philadelphia, 23s.@26s.; Ohio and extra, 24s.@26s.; Canadian, 24s.@27s.

MAIZE.—In Mark Lane, London, white maize was quoted at 30s.@32s.; yellow, 27s.@28s. per quarter. In Liverpool, American, white and mixed, brought 27s. to 29s. 6d. per 480 pounds; Galatz, 32s.; Dari, 23s. 9d. to 24s.

NOTE ON WEIGHTS AND MEASURES.—Our American bushel is the same as that which in England is known as the Winchester bushel. An imperial English bushel is equal to 1.03152 Winchester bushels, a difference of about 3 per cent. In the London markets grain is quoted by the quarter, equal to 8 imperial or to 8.25216 Winchester bushels. In Liverpool grain is marketed by weight instead of bulk, using the cental of 100 pounds. Flour, for some reason, is bought and sold in England in parcels of 280 pounds. In London maize is quoted in quarters; in Liverpool, in parcels of 480 pounds; American flour is the only flour marketed in barrels of 196 pounds each; California barrels contain 200 pounds, or two centals, each. Sometimes flour imported into the United Kingdom is designated by hundredweights, (cwts.,) each of which is one-twentieth of the "long" ton of 2,240 pounds. In California the "short" ton, equal to 20 centals, or 2,000 pounds, is universally used. East of the Rocky Mountains both the long and the short ton are used, but for different measurements. A shilling in English money is equal to 25 cents



MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

MAY AND JUNE, 1876.



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1876.

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MONTHLY REPORT.

STATISTICAL DIVISION,
DEPARTMENT OF AGRICULTURE,
Washington, D. C., June 20, 1876.

SIR: I respectfully report for publication a description of the exhibits made by the Department of Agriculture at the Centennial Exhibition; a report of the condition of the crops in June, with estimates of areas planted; and sundry minor statistics.

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

CENTENNIAL EXHIBITS OF THE DEPARTMENT OF AGRICULTURE.

The participation of the Government in the greatest exhibition of the age, and the prominence of an interest in which half the people of this nation are directly engaged, render necessary positive and efficient effort of the Department of Agriculture to illustrate national resources, production, and progress in rural arts. With a regard for economy more in accordance with the demand of the times than with the importance of the subject or occasion, the Department's proportion of the first appropriation for the Government building and Department exhibits was but a tenth of all, and of the second, nothing. The allotment of space, 6,400 feet, 160 by 40, was ample for the limited means available for filling it, and it was duly divided into sections to afford opportunity to the several divisions of participating in the Exhibition. The result, as seen in the collection at Philadelphia, has secured a favorable preliminary verdict, both of press and people, and is acknowledged to be highly creditable to the Department and interesting and instructive to the visitors, native and foreign.

As a current record of Department work, to utilize and perpetuate which the monthly report was established, a brief description of these exhibits is presented, which will also serve to direct the inquiries of the casual visitor to points of personal or general interest, and to systematize the labors of the press reporter, to guide his pencil or refresh his memory, for the benefit of that great class of American farmers who cannot personally inspect the exhibits.

The location of the Department in the Government building is in the

transept which projects southwestwardly from the center of the building, one side of which is occupied by the Post-Office Department. The various branches and specialties of the Department service are represented more or less fully in the collection.

ENTOMOLOGICAL DIVISION.

The division of entomology, as organized and conducted, involves the curatorship of the Agricultural Museum, which has been increasing in its attractions during the past ten years. It occupies in the Department a hall 102 by 52 feet, and in the Centennial allotment a space of 60 by 40 feet. The material of the various lines of exhibit is only in part from this museum, being in some of them almost entirely from new collections; and the arrangement, with new cases and fixtures and other accessories of exhibition, is more complete and systematic than in the old collection. The entomologist and curator, Townend Glover, makes a valuable exhibit in economic entomology of insects arranged with reference to the plants or products they infest, and also presents his illustrated catalogue of insects, nearly three hundred copper-plates engraved by his own hands, illustrating by figures insects of all orders in entomology. The exhibits of the museum he assigned to the assistant entomologist, Charles R. Dodge, whose collections of grains, textile fibers, and paper material, are of great interest and practical value. These divisions use sixteen cases, four of which illustrate the cereals and tobacco; three are occupied with fibers, four with fruits, one with insects, and four with insectivorous birds and domestic poultry.

These classes of objects are an ascending series, beginning with the products of the earth, as grains, fruits, tobacco, cotton or wool; next, the insects which prey upon them and blast the hopes of patient labor; and, third, the birds which restore the balance, and render successful production possible by limiting the depredations of the countless hordes of insect spoilers.

The arrangement of the products of agriculture is based upon an equally natural system. First, the raw material, its specific kind and the geographical range of each; then its manufactures in regular series, from the slightest manipulation to the most skillful mechanical processes and their ultimate results, whether in tissue, texture, or other form of completed elaboration.

The first case in the collection displays about one hundred and fifty specimens of tobacco, one hundred samples in the leaf from eighteen States, including the popular named varieties in different modes of curing, ranging in quality from the cheap shipping qualities to fancy cigar-wrappers worth \$4 per pound. Samples are also shown illustrating the manufacture of smoking and chewing tobacco in all its specialties. Specimens are labeled to show the State in which they are grown.

There are three cases for the display of about nine hundred samples of grain, comprising a collection of various cereals, selected expressly for the exhibition by agents of the Department, arranged in glass jars a foot in height, and so placed that a comparison of well-known varieties from different States can easily be made; next, one hundred and twenty-five samples of Indian corn, displayed in the ear upon black tablets, and arranged for comparison of differences between northern and southern grown corn, and equal variations and contrasts of varieties grown upon the same line of longitude. To make the grain collection complete, upward of one hundred samples of manufactured products of cereals are shown, illustrating processes of manufacture in great

variety, including recent remarkable improvements, and the fancy products, once sought only by the epicure, which are rapidly making their way to all well-supplied tables.

The collection of fibers, both textile and paper-making, if not exhaustive, is representative, and broadly illustrative of these important branches of mechanical extension of the raw material. About five hundred samples of wool are shown, representing the principal breeds established in this country, with their crosses of every grade. Though a majority of the samples have a growth of but ten months, they are generally fine specimens, making an exceedingly interesting exhibit. The system of illustrating processes of manufacture by a series of their products enables the farmer to see, in any style of piece-goods, shawls, carpets, or flannels, the particular grade of wool which enters into its composition and the various processes by which the special result is accomplished. In the cotton collection there are about one hundred and twenty samples, showing the principal known varieties cultivated, both in lint and seed. Here the processes of manufacture are likewise shown, from the raw material, through all its ten or twelve changes, to the manufactured fabric, as well as the numerous varieties of fabrics made from this textile. Flax and jute are shown in the same case. A great variety of miscellaneous fibers, including silk, ramie, flax, cotton, hemp, asclepias, and many of the fibers from the far West, of little utility in manufacture, and yet interesting as showing the resources of the country, are also presented.

A valuable collection of paper materials, about one hundred samples, exhibits, from the raw material to finished paper, the manufacture of bogus, scrap, and rope manila, straw, book and colored paper, flat and linen paper, besides a number of kinds of material not in general use, such as okra, spartina, ramie, yucca, and others. Wasp-paper is shown as a sample of the first manufacture of paper—by the present process—from wood.

The exhibit of models of fruit and vegetables, made of plaster painted in oil-colors, fills four cases and a part of two others. In all it comprises nearly three thousand specimens, illustrating about one thousand varieties of the apple, six hundred of the pear, fifty of the potato, besides plums, cherries, melons, pumpkins, and roots. The amount of space allotted was not sufficient for the display of the entire collection. The apples include several specimens of each of the standard varieties, like the Baldwin, Northern Spy, etc., to show the characters assumed by the same kind when grown in different parts of the country. There are also some of the distinctively southern apples, such as the Hilton, Nickajack, Shockley, etc. Among the pears is a small collection of some varieties new or little known, from original specimens contributed by Ellwanger & Barry. The miscellaneous models are samples of seedling strawberries grown by the Department; twelve different kinds of melons, including all that are usually raised for market; a large pumpkin, the original of which weighed 122 pounds; and numerous vegetables from Northwest Minnesota and other remote parts of the country.

The collection of economic entomology, filling twenty-four glass-covered drawers or boxes, occupies one high case next to the collection of small birds. Over one thousand specimens are exhibited, and these are arranged, not according to their classification, into families, genera, &c., but with regard to the food-plant, or more particularly the farm-product injured or destroyed by them. Thus, under the head of potato the various insects known to injure the plant, in root, stalk, leaf, or fruit, are shown from egg to perfect insect, when practicable, accom-

panied with samples illustrating the mode of injury. Thus, cotton tobacco, corn and other cereal products, the cucurbitaceous plants and plants of the kitchen-garden, fruit-trees, shade and forest trees, are all represented by the various insect-pests preying upon them. Other cases illustrate the insect-pests of man and cattle, the foes of the household and the larder, the silk-producing insects, and the gall-makers, while others show the principal insects that are beneficial to mankind, either by destroying noxious species or in the capacity of scavengers. The collection is not, by any means, complete, but forms the nucleus of a strictly "economic collection of entomology," which to the farmer is of more practical value than any other method of arrangement that can be adopted.

In addition to the above, a collection of three hundred colored plates on copper are shown, on which upward of seven thousand figures of the injurious and beneficial insects of the United States are illustrated.

Having referred to the various lines of production presented in the museum, and to the insects that prey upon it, we naturally come, in accordance with the classification adopted, to the third branch of the collection, the cases containing birds, intended to exhibit to the farmer such as are beneficial, as destroyers of obnoxious insects, as well as those which feed upon his fruits and grains more or less exclusively. The character of the birds is indicated in each case by the mark upon the perch or label, white indicating purely insectivorous birds, black those of wholly pernicious habits, and both colors the relative proportion of each element in those possessing more or less marked proclivities for a mixed diet of insects and fruits in their season. A little box in close juxtaposition to each affords the means of judging of these characteristics by an exhibit of the dried contents of a full stomach—evidence very strong, if not conclusive, in each case.

The cases containing poultry are intended to show to poultry-fanciers and farmers true type-specimens of the various breeds, mounted by the taxidermist so as to exhibit prominently the peculiarity of each breed as to size, form, and color, so that the farmer, when he buys a new breed, can ascertain whether it is true to name, and judge whether it is what he wants for his own locality or to improve his old stock. The collection includes all the principal varieties, both native and foreign. There is also a collection of pigeons, and about thirty specimens of ducks, representing the crosses between the common domesticated and the mallard.

BOTANICAL DIVISION.

The collection of the botanist, George Vasey, is confined to forest-products. It presents nearly a complete exhibit of the forest-trees of the United States. There are about four hundred species and varieties, each represented by sections of the trunk and corresponding botanical specimens of the foliage, flowers, and fruit. The sections are two feet long, in two pieces, one showing the outer surface of bark and the other sawed longitudinally and dressed to show the character of the grain and wood. Above each section, inclosed in a frame, is the corresponding botanical specimen of foliage, flowers, and fruit. This collection was obtained through twelve collectors in different parts of the Union. The greatest care has been taken to have all the specimens authentic and true to name. It is a remarkable and striking display of the forest-wealth of our country. There are fifty species of semi-tropical trees of Southern Florida, including five species new to our flora. There are twenty-five species from Texas, and thirty species from Southern California

and Arizona, including some of the rarest and most interesting trees of that country, particularly the tree Yuccas and a recently-known Palm. There are fifty species from the Pacific slope of California, and ten or twelve from Oregon, and thirty from the Sierra Nevada Mountains of California, including large sections of some of the noblest coniferous trees of the world, such as the Sugar-Pine, the Douglas Spruce, the Silver Fir, and others. From the mountains of Utah and Colorado there are twenty-five to thirty species. From Illinois and the Western States, fifty; from Vermont, twenty; from Virginia, fifty, most of which were obtained from the old Mount Vernon estate of General Washington. The Southern States, exclusive of South Florida, contribute about ninety species. The Oak family is represented by thirty species, including the famous live-oak of the South, the various white and black oaks, both of the eastern and western portions of the continent. The Pine family is also represented by thirty species, of which more than half are peculiar to the Rocky Mountains and western coast. Of Spruces there are sixteen species, and of other conifers about twenty.

GARDENS AND GROUNDS.

The superintendent of gardens and grounds, William Saunders, who is also in charge of the Department collections at the Centennial, exhibits a plan of the grounds of the Department at Washington, with a catalogue chart of the different orders represented in the Arboretum, and sundry photographic views of different sections of the grounds.

MICROSCOPY.

The exhibit of the microscopist, Thomas Taylor, consists of about five hundred water-color drawings, the larger proportion representing the leading types of the genera of microscopic fungi; another section of the exhibit presents the results of original investigation upon chemical tests for flax, cotton, ramie, silk, wool, hair, and both animal and vegetable cellulose; and still another series, illustrating the principal vegetable starches to the number of about one hundred varieties. These drawings present highly magnified views of all these microscopic objects, including those most important in economic mycology, especially the fungi commonly known as molds, so destructive to vegetation. The edible and poisonous mushrooms are distinguished in one class of these drawings. The mycologist proposes to make a collection of all the known edible mushrooms of the United States, of which descriptions will from time to time appear in the Monthly Report.

CHEMICAL DIVISION.

The chemist of the Department, William McMurtrie, presents the following description of his exhibits:

Agricultural chemistry may be defined to be the study of the chemical properties and relations of soils and fertilizers, and of those agricultural and horticultural products resulting from their manipulation, the value of which depends upon their chemical composition and the methods for the utilization of which involve chemical processes. This may on some accounts be considered a somewhat comprehensive definition, but it embraces only such matters as legitimately fall within its scope, and it covers the ground laid out by the chemical division of the Department of Agriculture for the collection to be shown in the Government exhibit in the International Exhibition of 1876, designed to illustrate the objects and ends of the division, viz, the collection and dissemination of information of agricultural interest and of a chemical character.

Following the general idea thus enunciated, the materials collected and at present on exhibition in Philadelphia, are divided into two grand divisions, as follows:

1. Soils and fertilizers.
2. Vegetable products, the value of which depends upon their chemical composition, and the methods for the utilization of which involve chemical processes.

In addition to the materials included in these two grand divisions, the collection contains a series illustrative of the various steps involved in the manufacture of butter and cheese.

The soils and fertilizers are appropriately grouped, as follows:

1. Soils from different geological formations.
2. Known rocks, with samples of the virgin soils formed from them by their disintegration and decomposition.
3. Marls—a group which may be subdivided into calcareous or shell marls, greensand marls, and phosphatic marls.
4. Mineral fertilizers, consisting of phosphatic rocks and limestones.
5. Vegetable and animal fertilizers.
6. The combination of the natural fertilizers to produce the manufactured or artificial fertilizers and a series of specimens of these products found in American markets.

The soils from the geological formations of different ages were collected under the supervision of Prof. George H. Cook, State geologist of New Jersey, and illustrate very fairly the character of the soils common to the sections belonging to the several formations represented.

The second subdivision of soils—those formed directly from disintegration and decomposition of rocks—consists of a series of virgin soils collected by Prof. E. L. Berthoud, of Cañon City, Colorado, each of which was taken from a large area of known rocks with no opportunity of admixture with *débris* from breaking down of rocks of a different character, and they give a fair representation of the soils which these rocks are capable of producing, and their consequent agricultural value. Alongside of the specimens of soils are fragments of the rocks from which they are formed.

The marls are rather limited in number, and consist of the varieties named above. The greensand marl formations are found most extensively in New Jersey, but are by no means confined to that State alone. They may also be found in the recent geological formations of very many of the States of the Atlantic coast south of New Jersey. Their value, as is well known, depends upon the potash and phosphate of lime they are able to furnish to the soil.

The marls, which are the more numerous of the recent geological formations, but which are by no means as valuable as the greensand marls, are the calcareous or shell marls, whose value depends almost entirely upon the carbonate of lime in a friable condition they contain, and of which they are wholly or in part composed.

The third class, which is far more limited with regard to its geographical distribution, embraces the phosphatic marls found in vicinity of the phosphatic rock deposits near Charleston, S. C. They are taken from different depths below the surface, ranging from 3 to 56 feet, and contain a fair percentage of phosphate of lime. Their value depends upon the percentage of this important constituent, (which varies with the depth from which they are taken,) and upon their mechanical condition, which is favorable to their removal and application to the soil. They are by no means as valuable, but are closely allied to the phosphatic rocks spoken of above, which constitute the next group. These rocks are represented by a series of specimens collected under the supervision of Prof. C. U. Shepard, of Charleston, and embrace the two varieties known as *river rock* and *land rock*, terms depending upon the immediate locality from which they are taken. There is little difference in the chemical composition of these two varieties, but there is a marked difference in the color of the rocks, as well as of the fossils accompanying them. The color of the river rock is very dark, while that of the land rock is quite light, and in the collection these two varieties, with the fossils found in connection with them, are so arranged as to illustrate clearly these differences.

The vegetable and animal fertilizers which constitute the next group, while they are not as extensive in point of quantity as those already named, are of no less relative value. They consist of muck, peat, marsh-weeds, sea-weeds, cannerine, and fish scrap; pork cracklin, dried blood, and other refuse matters from the abattoirs; and finally, of the excrement of bats, large deposits of which are found quite widely distributed in caves of many of the inland Southern States, and which bids fair to be a fruitful source of fertilizing for the plantations of the South. A complete description of some of these deposits, with the results of analyses of samples taken from them, will be found in another part of this report.

The artificial fertilizers are made up by the combination, according to formulæ adopted by the several manufacturers, of the natural fertilizers enumerated. Many of those found in American markets, and indeed most of them, are improved by addition of materials obtained as by-products of manufacturing processes, or imported from other countries. The method generally employed in this branch of manufacture

is illustrated by a series of products taken from the different stages of the process as carried on by the Pacific Guano Company of Boston and Charleston. The series consists of specimens of raw rock, the crushed and ground rock, sulphur, niter, and sulphuric acid, the rock treated with acid, sulphate of ammonia, fish-scrap, Strassfurth potash salts, and the mixture of the last four in the finished products.

This series is followed by another, consisting of samples of the products put upon the markets by different manufacturers.

We now come to the second grand division of our collection, which is subdivided into different groups as follows:

1. Cereals and the products resulting from their utilization.
2. Materials illustrating the production of sugar.
3. Products illustrating the processes of fermentation and distillation of amylaceous and saccharine substances.
4. Products illustrating the preparation of tobacco for consumption.
5. Tanning and dyeing materials.
6. Materials resulting from the dry distillation of vegetable products.
7. Production of vegetable oils.
8. Preservation of fruits and vegetables, and vegetable products prepared for food.
9. Products of the American Materia Medica, and the active proximate principles separated from them.

The utilization of cereals consists in the manufacture of flour, meal, and starch.

The manufacture of flour consists of the production of meal from the grain by grinding, the separation of the flour (the amylaceous and glutinous constituents) from the bran (cellulose) by sifting, and the further purification of the flour by special methods. These processes are illustrated by means of specimens of materials obtained in the production of flour and meal from wheat, rye, corn, and buckwheat. The preparation of the cereals for food by other methods is illustrated by specimens of the finished products obtained by means of them. Among these products may be enumerated hulled corn or samp, hominy, wheaten grits, steam-cooked and desiccated grains, including wheat, barley, and oats, either in the whole grain, or the crushed grain and meal. The further utilization of grain in the manufacture of starch consists of the separation of the amylaceous constituent from the glutinous, and this is effected in two ways, by fermentation and by washing with dilute alkaline solutions. The first method is the one more generally employed for manufacture of starch for laundry purposes, sizing, and conversion into gums and starch substitutes. The second method, while it is also employed for manufacture of laundry starch, is particularly employed in the purification of starch for the purposes of food.

The fermentation method is represented by a series of samples taken from different stages of the process as carried on by O. A. Taft, jr., & Co., of Providence, R. I.; *i. e.*, meal, meal in process of fermentation, washed starch, dried and fully crystallized starch, and ground starch. Following these specimens are others representing manufacture of gums and starch substitutes from starch by various methods.

The washing process is represented by samples of finished products furnished by Kingsford & Co., of Oswego, N. Y., and by Duryea & Co., of New York City; but specimens from the intermediate stages are not shown, from the fact that the details of the method employed are not made public. The collection also contains samples of starch manufactured from potatoes.

The second group of this grand division contains samples of material designed to illustrate the manufacture of sugar. The sources from which this important product is obtained are the sugar-cane, the beet-root, and the sap of the sugar-maple.

The process of manufacture of sugar from the cane, as carried on in this country, consists of four stages, *viz*: separation of the juice; concentration of the juice; separation of raw sugar by crystallization and filtration; purification of the raw sugar. The samples exhibited in this group consist, therefore, of materials taken from the different stages here named, and placed alongside the product from each stage of the process of manufacture is a model of the machinery employed.

The beet-sugar industry is represented by manufactured products alone, on account of the difficulty experienced in securing samples of the products resulting from the process employed.

The production of maple-sugar is represented by samples of raw and purified sugar, and by photographs of maple forest and concentrating-house, showing the methods of collecting and concentrating the sap.

The third group represents the processes of fermentation and distillation for production of alcoholic liquors, and embraces two subdivisions, *viz*:

1. Alcoholic liquors produced by fermentation of amylaceous substances, (grains.)
2. Alcoholic liquors produced by fermentation of saccharine substances, (fruits.)

These subdivisions may be still further divided into—

1. Products resulting from simple fermentation; and,
2. Products resulting from distillation of fermented materials.

Under the head of simple fermentation of amylaceous substances we have the pro-

duction of beer, ale, and porter, which is appropriately illustrated by means of samples taken from different stages in the process of manufacture.

By distillation of fermented amylaceous substances we have the production of whisky. This important branch of industry is represented by samples of grain generally employed in the manufacture, both in the raw state and as prepared for fermentation; samples of the yeasts and mashes necessary to the production of different varieties of whisky, and the fermented mashes or beer. Following these are the plans of an American distillery and a model still, succeeded by the distillates in different stages of concentration and rectification.

By fermentation of saccharine substances we have the production of wines; and from distillation of the fermented products, brandy results. This branch of manufacture is represented by samples of American wines and brandies.

The fourth group contains specimens intended to show the chemical changes involved in the preparation of tobacco for consumption. These changes in the character of the leaf for chewing and for snuff, consist in sweetening and fermenting, and the products necessary to the illustration of these changes are therefore shown.

Group 5 is one of great interest and importance in this country, and contains specimens of the materials used for tanning and dyeing. The tanning materials consist of samples of barks, herbs, and leaves. Among the herbs and leaves are those lately discovered to be of value in this particular, viz, the *Ephedra antispyllitica* and the *Polygonum amphibium*. The manufacture of tanning extracts from hemlock and oak barks, both for home consumption and for exportation, is represented by the barks, the raw and the concentrated extract. The American dyes are represented by samples illustrating the manufacture of flavine from oak bark, indigo produced from native plants, and by barberry root, orchilla weed, eudbear, &c.

In the next group follows a series containing the products resulting from the dry distillation of vegetable products. This group may be divided into two parts, viz, distillation of wood for production of crude acetic (pyroligneous) acid and acetates; and distillation of pine-tree products for production of turpentine and rosin. The crude acetates are used largely for mordants in the process of dyeing, and they are therefore accompanied by specimens showing their application in calico-printing. They are further used for the production of pure acetic acid.

The pine-tree products consist of different grades of virgin dip, turpentine, rosin, tar, and pitch, arranged in the order of their production.

The production of vegetable oils involves two processes—that of expression and that of fractional distillation—necessary to the separation of fixed oils from seeds, and of the essential or volatile oils from herbs and leaves. Of the fixed oils manufactured on a large scale, and the production of which constitutes important branches of industry in this country, we have three, viz, cotton-seed oil, linseed oil, and castor oil, and these oils, with the waste material pertaining to their production, constitute Group 8 of the second grand division.

The method for the production of oil from cotton-seed consists, essentially, of three parts, viz, removing the hull, crushing the seed, and removal of the oil by pressure. The production of oils from other seeds requires only the last two processes, the first being unnecessary. The specimens in this group, therefore, necessarily consist of raw seeds, decorticated or hulled seed, hulls, crushed seed or meals, raw oil-cake or residue from the press, and refined oil. The cotton-seed series is accompanied by specimens of the varieties of soap manufactured from the oil. Of the essential or volatile oils, we have eighteen varieties manufactured from indigenous products, and samples of each of these oils are found in this group.

Group 8 is intended to illustrate the methods employed for the preservation of fruits and vegetables. Those most extensively in use in this country are hermetically sealing, packing in sugar or sirup, and desiccation, and the specimens, consequently, consist of fruits preserved by these methods. This group also contains a series of vegetable products prepared for food by special methods, contributed by E. C. Hazard & Co., New York City.

Group 9 contains a series of American drugs, consisting of specimens of herbs, roots, and leaves, having medicinal properties, and are accompanied by their active proximate principles, (alkaloids, resins, or oils, as the case may be,) which have been separated. This group was prepared under the direction of Prof. E. S. Wayne, of Cincinnati, and contains some principles never separated before.

The collection illustrating the manufacture of butter and cheese is well described in the following terms by Prof. G. C. Caldwell, of Cornell University, Ithaca, N. Y., who has had charge of the preparation and analysis of the samples:

"The collection for the illustration of the manufacture of the products of the dairy, prepared and analyzed at the laboratory of agricultural chemistry in Cornell University at the request of the Department of Agriculture, and placed in its exhibit at the Centennial, consists of samples obtained directly from dealers in dairy supplies, or from factories or private manufacturers of butter or cheese.

"It begins naturally with salt, rennet, and annatto—the first being universally used

in the manufacture of both butter and cheese, the second always in the manufacture of cheese, and the last-mentioned substance being very commonly used in coloring both butter and cheese.

"In regard to the samples of salt, four of which are of English manufacture and one of American, the chemical analysis serves the useful purpose of showing that the difference between them is very slight, and in practice would appear to amount to nothing at all; and it also shows that the best American is fully equal to the best English product.

	Pure salt calc. from the chlorine.	Line.	Sulphuric acid.
Syracuse salt.....	97.74	0.4	0.69
Ashton's Liverpool salt.....	97.71	0.50	0.9
Worthington's Liverpool salt.....	97.65	0.55	0.74
Marshall's Liverpool salt.....	97.99	0.47	0.72
Dean Bros.' Liverpool salt.....	97.77	0.52	0.91

"Of the annatto, the seed itself from which the coloring matter is obtained, is shown; this is used by some dairymen directly for the preparation of their coloring matter; then comes the so-called basket annatto, the usual form in which the coloring matter, extracted from the seeds by water, comes to market; there are exhibited also two preparations of annatto made in this country, the annattoine and the golden extract of annatto, both of which are quite free from any injurious ingredient; their use is preferred by many to that of the crude article. As there is no satisfactory method of determining the proportion of coloring matter in this substance, the results of the chemical analysis of its various forms, in use among dairymen, have little practical value; they do show, however, a very great difference between the three grades of basket annatto, for that which is richest in organic matter is probably richest in coloring matter.

	Water.	Ash.	Organic matter.
Basket annatto No. 1.....	32.64	10.78	56.59
Basket annatto No. 2.....	22.96	28.83	48.21
Basket annatto No. 3.....	44.18	8.34	47.48
Annottoine.....	9.13	4.66	86.21

"Of rennet two samples are shown, the domestic and the foreign. There being no known means of estimating with any accuracy the proportion of the coagulating principle of the rennet, no analysis was made of these samples.

"While in Europe there is a great number of methods of making cheese, with as great variety in the character of the products, our American dairymen confine themselves to a very few methods; in fact three different types will represent the main bulk of the manufacture at the cheese-factories of this country.

"Concerning the most common mode of manufacture, that which yields the so-called whole-milk cheese, made from the whole of the milk without any skimming, the main details of the process are familiar to all who are interested in the subject. Therefore we simply give below the results of the chemical analysis of several samples obtained from different parts of the country, and represented in the collection:

	Water.	Ash.	Fat.	Casine, sugar, &c.
New York factory cheese, No. 1.....	31.41	3.53	37.88	27.18
New York factory cheese, No. 2.....	35.68	3.60	35.15	25.57
New York factory cheese, No. 3.....	35.24	3.23	35.68	25.85
New York factory cheese, No. 4.....	33.73	4.05	35.57	26.65
Massachusetts factory cheese, No. 1.....	34.18	3.02	33.92	28.88
Massachusetts factory cheese, No. 2.....	38.5	3.73	31.19	26.58
Maine factory cheese, Jersey milk.....	28.11	2.71	41.03	28.15
Wisconsin factory cheese.....	35.49	3.34	34.05	26.12

"Of the second method of manufacture, that by which the ordinary skim-cheese is produced, the usual proportion of cream being taken from the milk for the manufacture of butter, two varieties are presented. By the one method, and that which is in most common practice, the skimmed milk alone is used for manufacture into cheese; by the other method, which has been but recently introduced, the buttermilk is added to the skim-milk; the fresh milk is heated to 130° Fahr., cooled to 65°, allowed to stand from twenty-four to forty-eight hours for the cream to rise, and the cream is churned sweet. The results of the analysis of the two kinds of cheese are given below:

	Water.	Ash.	Fat.	Case- ine, &c.
Common skim cheese	42.38	3.63	20.55	33.44
Scalded milk and buttermilk cheese	44.48	4.50	15.22	45.80

"While these analyses indicate a larger proportion of fat in the ordinary skim-cheese, there was nevertheless a marked difference in quality in favor of the other; the latter was softer and more salvy, and probably more digestible. It may be said, further, that the proportion of fat in skim-cheeses is not so constant as in whole-milk cheese. Another sample of scalded skim-milk and buttermilk-cheese analyzed in this laboratory was found to contain 20 per cent. of fat.

"The third important method of cheese-making has also been but recently introduced, and the practice of it is as yet confined to a few factories. As in the manufacture of skim-cheese, the butter-fat is mostly removed from the milk by skimming; but, while the milk is coagulating after the addition of the rennet, as much of a clean animal fat, manufactured from the beef's caul, is most intimately mixed with the forming curd as it will take up; the excess of oil floats on the surface after the coagulation is completed, and is skimmed off; a cheese is thus obtained which, as the analysis below shows, is sometimes richer in fat than the ordinary skim-cheese:

	Water.	Ash.	Fat.	Case- ine, &c.
Oleomargarine cheese	40.56	3.98	20.43	36.97

"For some unexplained reason the curd will not always take up the same amount of fat, so that its proportion in the cheese is variable; in the case of other analyses of the same kind of cheese made in this laboratory the proportion of fat has ranged from 18 to 25.9 per cent.

"This fat that is added to the curd is sometimes called oleomargarine, and the cheese is hence conveniently distinguished from other kinds by the name given to it above; in respect to quality it is much superior to the ordinary skim-cheese, although, as in the case of the comparison between the two varieties of skim-cheese already mentioned, the better cheese is not always found to contain the larger proportion of fat.

"We have found but one veritable imitation of the styles of cheese so common on the continent of Europe. Limburger cheese is made in one place in the State of New York somewhat in the same manner as it is made in Europe. The analysis shows that it contains a large proportion of water—43.67 percent.—and somewhat less than the usual proportion of fat that is found in whole-milk cheese, or about 30 per cent.

"The collection further embraces all the several materials used and by-products formed in the three most important methods of cheese-making; the fresh milk, curd, whey, and ripe cheese in the whole-milk cheese manufacture. In addition to these, the skim-milk, cream, and buttermilk in the case of the skim-cheese manufacture. The analysis of these substances being not fully completed at this time of writing, they will be communicated in the next monthly report.

"In the manufacture of whole-milk cheese a considerable portion of the fat remains in the whey. In a few cases this fat is collected and made into whey-butter, that brings a fair price in the market; and the removal of this fat does not, it is asserted, lessen the feeding-value of the whey. A sample and an analysis of this butter are presented; but if a chemical analysis is no true test of the quality of a sample of cheese, still less is it so in the case of butter. Two samples of factory-butter and one of butter made from the milk of Jersey cows are also contained in the collection, of which the last mentioned was by far superior to the others in quality; but no such difference is indicated in the results of the analysis given below:

	Water.	Ash.	Fat.	Caseine &c.
Jersey butter.....	11.29	3.20	84.76	0.75
Factory butter.....	12.36	2.98	83.41	1.25
Do	8.82	3.43	87.75	
Whey butter.....	9.77	1.67	88.56	

"A sample of Borden's condensed milk illustrates that important branch of dairy economy. The analysis reveals the large proportion of cane-sugar that is added to the milk, in order to get a product that will keep well.

"Composition of Borden's condensed milk.

Water.....	23.6
Ash.....	1.87
Fat.....	11.19
Caseine, (by difference).....	14.71
Milk-sugar.....	12.43
Cane-sugar.....	35.20

"Finally, we have to mention, as a by-product of some use, whey-oil, which is prepared from the whey, and is used for oiling the cheese in the curing-room. It melts at a lower temperature than butter made from the same material, and is destitute of the texture and flavor of good butter."

STATISTICAL DIVISION.

The exhibits of the statistician, J. R. Dodge, are designed to present in compact form and logical arrangement, with such aids to interpretation as are afforded by color and mathematical delineation, some of the main facts which illustrate the progress of settlement, production, and rural improvement in the United States. With a national census giving only the estimated production of the principal crops once in ten years, and very few of the States making any attempt in the direction of agricultural statistics, the field of prompt and general agricultural inquiry is left almost entirely to the statistical division of the Department of Agriculture. The rapid extension of cultivation in Western States and Territories and in the Pacific and Southwestern States, which causes changes in a single year that appear almost incredible, as for instance the increase of corn production in Kansas from 16,000,000 of bushels in 1874 to 80,000,000 in 1875, renders the work of this division exceedingly active and difficult. To gather the immense array of fragmentary data, and present for the Centennial a rounded and complete result in as many essential points as possible, much special statistical work was necessary, which has been reduced to a minimum by the extremely limited appropriation available for the service. The line of effort adopted includes, first, statistical record, in album form, of the several great classes of agricultural facts, in plain text and with map, diagram, and pictorial illustrations, designed to present briefly more succinct summary than has ever been presented to the public, and more complete in the classes of facts selected for exposition; second, a series of large outline maps illustrating the geographical distribution of crops and various results of original investigation; third, a series of charts and diagrams, showing important facts in production and distribution, industrial education, and political economy. The maps and charts were mostly finished before the opening of the Exposition. The magnitude of the labor required more time for finishing some of the larger charts. The general record, in its details, is among the exhibits so far as completed.

MAPS.—The larger charts consist of sixteen sheets, mounted as a single outline map of the United States, in size 17 by 12 feet, six in number, as follows :

1. Showing in five classes, by degrees of tinting, the value of the farm-lands of the United States by groups of counties, the first class including all below \$10 per acre ; the second, those not less than \$10, and not exceeding \$20 ; the third, those not less than \$20, and not exceeding \$30 ; the fourth, \$30, and not exceeding \$40 ; the fifth, \$40 and over.

2. Showing, by five degrees of color, the average monthly wages through the year of farm-labor (without board) in the several States, from records of an investigation made by the statistical division in 1875. The classes are as follows : Under \$20 : South Carolina, \$12.84 ; North Carolina, \$13.46 ; Alabama, \$13.60 ; Georgia, \$14.40 ; Virginia, \$14.84 ; Tennessee, \$15.20 ; Florida, \$15.50 ; Mississippi, \$16.40 ; Kentucky, \$18.12 ; Louisiana, \$18.40 ; Missouri, \$19.40 ; Texas, 19.50. Under \$25 : Maryland, \$20.02 ; Delaware, \$20.33 ; Arkansas, \$20.50 ; West Virginia, \$20.75 ; New Mexico, \$22.75 ; Kansas, \$23.20 ; Nebraska, \$24 ; Ohio, \$24.05 ; Indiana, \$24.20 ; Iowa, \$24.35. Under 30 : Illinois, \$25.20 ; Maine, \$25.40 ; Wisconsin, \$25.50 ; Pennsylvania, \$25.89 ; Minnesota, \$26.16 ; New York, \$27.14 ; Michigan, \$28.22 ; Connecticut, \$28.25 ; New Hampshire, \$28.57 ; Vermont, \$29.67. Under \$35 : Rhode Island, \$30 ; New Jersey, \$30.71 ; Massachusetts, \$31.87 ; Dakota, \$32.50. \$35 and over : Washington, \$35 ; Utah, \$35.50 ; Oregon, \$38.25 ; Colorado, \$38.50 ; California, \$44.50 ; Montana, \$45 ; Wyoming, \$47.50.

3. Showing by groups of counties, in five shades of color, the proportion of woodlands in the farm-areas reported in the last census. The first class includes all counties with less than 15 per cent. in forest, the other classes divided, respectively, by 30, 45, and 60 per cent.

4. Showing the distribution of the product of the sugar-crops—cane, sorghum, maple, and beet—and indicating, by three shades of color, the relative amount of such production in groups of counties.

5. Showing the distribution of the production of the textile fibers—cotton, hemp, flax, and wool—and indicating the localities of greatest production by three shades of color in each. Counties producing less than 1,000 bales of cotton, 50 tons of hemp, 100,000 pounds of flax fiber, or 100,000 pounds of wool are not indicated.

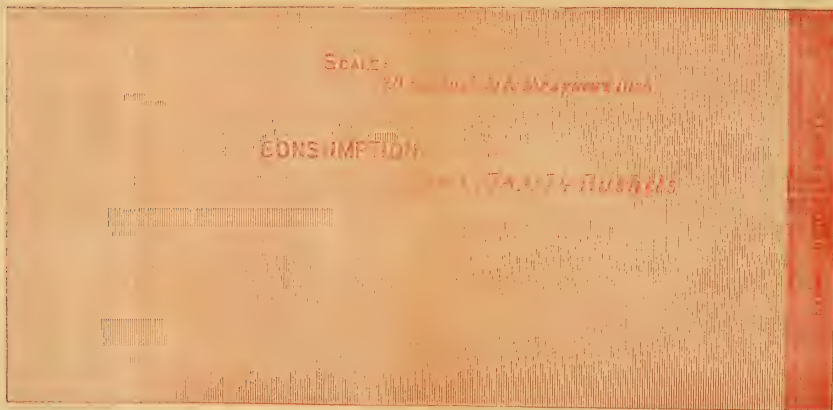
6. Showing the area in fruits of all kinds, by tints of States in four degrees of density, and indicating the prominent fruit sections and kinds of fruits most grown in each. The first class includes all States in which the entire fruit-area does not exceed 1 per centum of the improved land in farms ; *i. e.*, all farm-lands exclusive of forest and waste areas, *viz* : Minnesota, Iowa, Nebraska, and the Territories ; the second, Maine, New Hampshire, Vermont, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Wisconsin ; third, New York, Pennsylvania, Texas, Arkansas, Tennessee, West Virginia, Kentucky, Ohio, Indiana, Illinois, Kansas, California, Oregon ; fourth, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Florida, Michigan, Missouri.

CHARTS.—The larger charts are as follows :

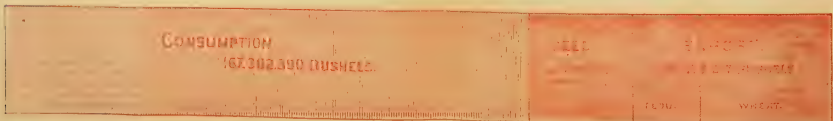
1. Showing the corn and wheat production of the country, with the exports, seed used, and home consumption for five years, constituting the first half of the present decade. It is 7 feet 6 inches in height and 4 feet 6 inches wide, with diagrams presenting these details of average production on a scale of three-fourths of a million bushels to the square inch. It is a lucid and striking showing, especially to foreigners unfa-

CORN AND WHEAT PRODUCTION.

CORN.—Average, 1870-1874. 992,258,900 bushels.



WHEAT —Average, 1870-1874. 261,013,920 bushels



miliar with the immensity of our cereal productions and the comparatively small proportion of the whole sent abroad.

The accompanying diagram represents it on a reduced scale. This chart makes the average supply of corn, in excess of export, for each unit of population, almost exactly 24 bushels for this period; the average area in cultivation, 37,699,803 acres; and the yield per acre 26.3 bushels. The statement accompanying the chart represents corn production and distribution as follows:

Years.	Production.	Consumption.	Seed.	Export.	
				Corn as meal.	Corn.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
1870	1,094,255,000	1,070,695,802	12,882,325	850,564	9,826,309
1871	991,898,000	944,807,278	11,363,712	1,235,360	34,491,650
1872	1,002,719,000	1,040,722,348	11,842,278	1,612,444	38,541,930
1873	932,274,000	883,222,450	13,065,716	1,551,228	34,434,606
1874	850,148,509	806,444,492	13,678,972	1,166,616	28,852,420
Total	4,961,294,509	4,745,892,370	62,833,003	6,416,212	146,152,915
Average	992,258,900	949,178,474	12,566,601	1,283,242	29,230,583

An importation of corn is a fact scarcely dreamed. A little crosses our northern boundary from the Dominion, averaging 68,864 bushels.

The average supply of wheat in excess of export is 5 bushels; area in cultivation (average for five years) 21,336,709; yield per acre, 12.2 bushels. The imports of wheat have averaged 1,502,541 bushels, of which about three-tenths have been exported. The wheat figures are as follows:

Years.	Production.	Consumption.	Seed.	Export.	
				Wheat.	Wheat as flour.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
1870	235,824,700	154,821,703	22,488,886	34,304,906	18,269,205
1871	230,722,400	161,810,806	22,915,830	26,423,080	12,572,675
1872	249,987,100	166,604,847	31,287,538	37,204,285	12,810,480
1873	280,372,700	155,735,041	33,127,961	71,039,928	20,470,470
1874	308,102,700	197,849,555	37,450,540	53,047,175	19,755,430
Total	1,305,029,600	836,811,952	160,270,604	224,019,574	83,878,210
Average	261,015,920	167,382,390	32,054,013	44,803,875	16,775,642

2. Showing the proportion of improved lands to the farm-area of each State and Territory. This is given in classes as follows:

Under 30 per cent.: North Carolina, South Carolina, Georgia, Louisiana, Texas, Arkansas, Dakota, Colorado, New Mexico, Washington, Wyoming; 30 and under 40 per cent.: Florida, Alabama, Minnesota, Mississippi, Tennessee, West Virginia, Kansas, Nebraska, Idaho; 40 and under 50 per cent.: Maine, Virginia, Kentucky, Missouri, California, Oregon, Nevada; 50 and under 60 per cent.: Rhode Island, Indiana, Michigan, Wisconsin; over 60 per cent.: New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Ohio, Illinois, Iowa, Utah, Arizona, Montana.

This chart also indicates the extent of several crop-belts, by a delineation of the line of northern limit respectively of sea-land cotton, upland cotton, sorghum, and winter-wheat. The line dividing spring wheat from winter is worthy of careful study, as it separates, tortuous as it appears, within one or two parts in a hundred, the entire production of

fall and spring sown grain. The line runs from near Boston through Southeastern Massachusetts and Connecticut, curves round the Housatonic Hills, strikes the vicinity of Saratoga, and runs in a northwesterly direction to Lake Ontario; thence including all our territory east of Lake Michigan, traverses a small section of Southwestern Indiana, strikes nearly west through the northern line of Missouri, crosses the Missouri at Saint Joseph, and gradually curves southward in Kansas as higher elevation is reached. The general direction from ocean to lakes is northwest, from lakes to the Rocky Mountains west-southwest. The line of northern limit of sorghum, on the contrary, preserves with a degree of uniformity a northwestern course. The difference is, sorghum is a summer crop, and its cultivation follows the summer isothermal line; while winter-wheat depends not only on winter and spring climates, but to some extent on the nature of the soil and methods of cultivation.

The sea-island-cotton line skirts the coast from Charleston to Galveston; and the upland line runs from Norfolk southwesterly, curving around the mountain-spurs of upper Georgia, cutting the northeastern section of Alabama, and thence sharply northward to include the Tennessee Valley and Western Tennessee, and all but the hill region of Arkansas, and southwestwardly through a corner of the Indian Territory and Texas to the Rio Grande.

Accompanying this chart is an estimate of the extent of cultivation of the principal crops, as follows:

	Acres.
Area, in 1875, in cereal-crops.....	87, 000, 000
Of which, in maize.....	44, 800, 000
Of which, in wheat.....	26, 400, 000
Area, in 1875, in hay-crops.....	23, 500, 000
Area, in 1875, in cotton.....	10, 750, 000
Area, in 1875, in orchards, vines, and fruits.....	4, 500, 000
Area, in 1875, in tobacco.....	460, 000
Total area in cultivation in 1875.....	133, 000, 000

The following statement of grand areas, in square miles, is also given:

	Square miles.
Area, including water-surface.....	4, 000, 000
Area of States and Territories.....	3, 611, 889
Area of the thirteen original States.....	341, 756
Area of public-land States and Territories.....	2, 867, 185
Area of public land unsold in 1870.....	2, 168, 331
Area of farm-lands in 1869.....	637, 086
Area of farm-lands improved.....	295, 189
Area of farm-lands in forest.....	248, 922

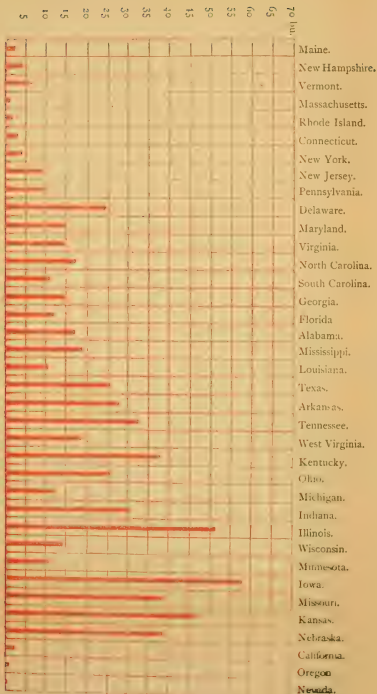
3. Showing the peculiarities of the agriculture of the Pacific coast region, and the local distribution and prominence of its principal crops.

DIAGRAMS.—To aid in comparison of different numbers and quantities, a tangible measure is useful to all, and to the multitude absolutely necessary. The arts of coloring and mathematical drawing are both brought into requisition for illustration of these abstract ideas which represent things so practical and commonplace. Among the diagrams which form a part of the exhibit are the following:

1. *The product of corn per capita.*—This is based upon the census year, 1869, to save the necessity of estimating anew both population as well as production, taking the census data for both. The figures on which the diagram is based are, for the several States:

PRODUCT OF CORN PER CAPITA.

Crop of 1869.



States.	Population.	Corn.	States.	Population.	Corn.
		<i>Bushels.</i>			<i>Bushels.</i>
Alabama	996,992	16,977,948	Nebraska	122,993	4,736,710
Arkansas	484,471	13,382,145	Nevada	42,491	9,660
California	560,247	1,221,222	New Hampshire	318,300	1,277,768
Connecticut	537,454	1,570,364	New Jersey	906,096	8,745,384
Delaware	125,015	3,010,390	New York	4,382,759	16,462,825
Florida	187,748	2,225,056	North Carolina	1,071,361	18,454,215
Georgia	1,184,109	17,646,459	Ohio	2,665,260	67,501,144
Illinois	2,539,891	129,921,395	Oregon	90,923	72,138
Indiana	1,680,637	51,094,538	Pennsylvania	3,521,951	34,702,006
Iowa	1,194,020	68,935,065	Rhode Island	217,353	311,957
Kansas	364,399	17,025,525	South Carolina	705,606	7,614,207
Kentucky	1,321,011	50,091,006	Tennessee	1,258,529	41,343,614
Louisiana	726,915	7,596,628	Texas	818,579	20,554,532
Maine	626,915	1,089,888	Vermont	330,551	1,699,888
Maryland	780,894	11,701,817	Virginia	1,225,163	17,649,304
Massachusetts	1,457,351	1,397,807	West Virginia	442,014	8,197,865
Michigan	1,184,059	14,086,238	Wisconsin	1,054,670	15,033,998
Minnesota	439,706	4,743,117			
Mississippi	827,922	15,637,316			
Missouri	1,721,295	66,034,075	Total	38,115,641	759,826,214

It will be remembered that this was a year of very deficient yield of corn. Illinois, which stands second in proportion to population, had less than two-thirds of a full crop. A diagram for 1875 would differ somewhat from this. Illinois and most of the States west of the Mississippi would nearly or quite double the present rate per head, and require several additional "stories" in the structure of the diagram.

2. *The product of wheat per capita*, from the crop of 1869, which was a large one for that date, but not so large as the crop of 1874 and of 1875, the acreage being on the increase. It will be seen that none of the New England States, with the sole exception of Vermont, produces one bushel per head; that New York and New Jersey grow about half of their wheat supply; and the Southern States, with the exception of Virginia, fail to produce five bushels for each inhabitant, though in ordinary years Tennessee and Kentucky have a surplus. The following table gives the crop of each State and the number of bushels to each inhabitant:

States.	Wheat.	No. of bush- els to each inhabitant.	States.	Wheat.	No. of bush- els to each inhabitant.
	<i>Bushels.</i>			<i>Bushels.</i>	
Alabama	1,055,068	1.05	Missouri	14,315,926	8.31
Arkansas	741,736	1.53	Nebraska	2,125,086	17.29
California	16,676,702	29.76	Nevada	228,866	5.39
Connecticut	38,144	.07	New Hampshire	193,621	.60
Delaware	895,477	7.16	New Jersey	2,301,433	2.54
Florida			New York	12,178,472	2.77
Georgia	2,127,017	1.79	North Carolina	2,859,879	2.66
Illinois	30,128,405	11.86	Ohio	27,882,159	10.46
Indiana	27,747,222	16.51	Oregon	2,340,746	25.75
Iowa	29,435,692	21.65	Pennsylvania	19,672,877	5.58
Kansas	2,391,198	6.56	Rhode Island	784	.00.3
Kentucky	5,728,704	4.33	South Carolina	783,610	1.11
Louisiana	9,906	.01.3	Tennessee	6,182,916	4.91
Maine	278,793	.44	Texas	415,112	.50
Maryland	5,774,503	7.39	Vermont	454,703	1.37
Massachusetts	34,648	.02.3	Virginia	7,398,787	6.03
Michigan	16,265,773	13.73	West Virginia	2,483,543	5.61
Minnesota	18,866,073	42.90	Wisconsin	25,606,344	24.28
Mississippi	274,479	.33			

3. *Area of wheat*, with the proportion sowed and drilled, respectively. This diagram is based on results of investigation by the statistical

division. It omits the New England States, which produce little wheat, nearly all of which is sown broadcast. The wheat-area in New York is divided equally between the two methods.

* In New Jersey, Pennsylvania, Delaware, and Maryland the drill greatly predominates. In the Southern States the area is small, particularly in the cotton States, and the drill is comparatively unknown. North of the Ohio River, in the winter-wheat States, the drill is very generally used, the proportion rising to 76 per cent. in Illinois.

In the spring-wheat region there are several reasons for prominence of broadcasting. One comes from a prevalent practice of sowing wheat on the irregular surface of a corn-field without plowing; another is found in the use of the combined cultivator and broadcast-seeder, which destroys many of the weeds that would otherwise be left between the drills. The gist of both of these reasons lies in the saving of labor by a compromise process, which is cheap though slovenly. The result of the investigation shows that 47 per cent. of the winter-wheat, and 30 of the spring, or 37 of both, represent the proportion seeded by the drill. The improvement by drilling is made to average 10 per cent. The average quantity of seed used for seeding winter-wheat is 1.35 bushels per acre; 1.24 for drilled, 1.44 for the sown. The details are as follows:

States.	Proportion sown.	Proportion drilled.	Increase of product by drilling.	Seed per acre.	
	Percentage..			Bushels in broadcast.	Bushels in drilling.
New York.....	50	50	13	1.80	1.60
New Jersey.....	45	55	6	1.95	1.60
Pennsylvania.....	30	70	12	1.74	1.49
Delaware.....	26	74	10	1.75	1.50
Maryland.....	24	76	7	1.70	1.43
Virginia.....	62	38	12	1.44	1.21
North Carolina.....	97	3	.....	1.07	.83
South Carolina.....	99	1	.....	1.00	.70
Georgia.....	99	1	.....	1.00	.90
Alabama.....	99	1	.....	1.00	.....
Mississippi.....	99	1	.....	1.25	.....
Texas.....	98	2	.....	1.18	.90
Arkansas.....	100	.....	.....	1.10	.....
Tennessee.....	96	4	10	1.20	1.10
West Virginia.....	58	42	12	1.53	1.33
Kentucky.....	92	8	10	1.36	1.11
Ohio.....	39	61	16	1.57	1.33
Michigan.....	49	51	9	1.62	1.40
Illinois.....	24	76	19	1.52	1.24
Indiana.....	49	51	15	1.48	1.21
Missouri.....	62	38	21	1.52	1.21
Kansas.....	55	45	16	1.49	1.23
Nebraska.....	51	49	17	1.56	1.25
California.....	98	2	.....	1.33	.....
Oregon.....	81	19	5	1.50	1.21

4. *Corn and wheat exports of fifty years, 1825 to 1875.*—The light space on the right of the diagram represents the volume of wheat, the darker shade the flour in its equivalent of bushels of wheat. On the left corn in bushels is shown, and the darker stripe gives the equivalent of the corn-meal exports. It will be seen that the first half of the period is credited with less than a fifth of the wheat-exports; and that the aggregate of the last quarter of the period is equal to the total shipment of the preceding three-fourths. A striking feature of the diagram is the remarkable increase in the export of whole wheat. For many years



AREA OF WHEAT.

PROPORTION SOWN AND DRILLED RESPECTIVELY.



scarcely an appreciable quantity, it increases slowly at first, rapidly after 1860, and at the close of 1875 it nearly equaled the aggregate of wheat-exports in the form of flour.

Year.	Wheat.		Flour.		Total wheat and flour.	
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1830.....	125,547	.....	23,259,700	.....	23,385,247	.....
1835.....	614,145	.....	26,209,820	.....	26,823,965	.....
1840.....	739,692	739,692	49,469,520	49,469,520	50,209,212	50,209,212
1845.....	1,842,841	.....	20,464,660	.....	22,307,501	.....
1850.....	2,582,533	2,582,533	69,934,180	69,934,180	72,516,713	72,516,713
1855.....	2,946,861	.....	31,373,485	.....	34,320,346	.....
1860.....	5,529,394	5,529,394	101,307,665	101,307,665	106,837,059	106,837,059
1865.....	10,184,645	10,184,645	61,424,140	61,424,140	71,608,785	71,608,785
1870.....	15,714,039	15,714,039	162,731,805	162,731,805	178,445,844	178,445,844
1875.....	16,446,955	16,446,955	65,747,590	65,747,590	82,194,545	82,194,545
1880.....	32,160,994	32,160,994	228,479,395	228,479,395	260,640,389	260,640,389
1885.....	38,808,573	38,808,573	78,891,340	78,891,340	117,699,913	117,699,913
1890.....	70,969,567	70,969,567	307,370,735	307,370,735	378,340,302	378,340,302
1895.....	138,306,907	138,306,907	98,788,665	98,788,665	237,095,572	237,095,572
1900.....	209,276,474	209,276,474	406,159,400	406,159,400	615,435,874	615,435,874
1905.....	81,808,364	81,808,364	57,273,925	57,273,925	139,082,289	139,082,289
1910.....	291,084,838	291,084,838	463,433,325	463,433,325	754,518,163	754,518,163
1915.....	34,304,906	34,304,906	18,269,205	18,269,205	52,574,111	52,574,111
1920.....	325,389,744	325,389,744	481,702,530	481,702,530	807,092,274	807,092,274
1925.....	26,423,080	26,423,080	12,572,675	12,572,675	38,995,755	38,995,755
1930.....	351,812,824	351,812,824	494,275,295	494,275,295	846,088,029	846,088,029
1935.....	39,204,285	39,204,285	12,810,430	12,810,430	52,014,715	52,014,715
1940.....	391,017,109	391,017,109	507,085,635	507,085,635	898,102,744	898,102,744
1945.....	71,039,928	71,039,928	20,470,470	20,470,470	91,510,398	91,510,398
1950.....	462,057,037	462,057,037	527,556,105	527,556,105	989,613,142	989,613,142
1955.....	53,047,175	53,047,175	19,755,430	19,755,430	72,802,605	72,802,605
1960.....	515,104,212	515,104,212	547,311,535	547,311,535	1,062,415,747	1,062,415,747

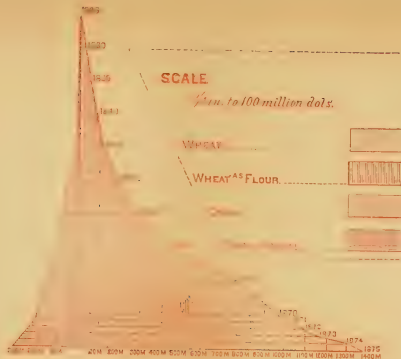
The value of wheat-exports for each half decade is thus given in detail:

Year.	Wheat.		Flour.		Total value of wheat and flour.
	Value.	Value.	Value.	Value.	
1830	\$112, 754	.....	\$24, 708, 090	.....	\$24, 820, 844
1835	737, 365	.....	29, 347, 649	.....	.....
.....	850, 119	\$850, 119	54, 055, 739	\$54, 055, 739	54, 905, 858
1840	1, 817, 067	.....	27, 231, 952	.....	.....
.....	2, 667, 186	2, 667, 186	81, 287, 691	81, 287, 691	83, 954, 877
1845	2, 900, 785	.....	31, 056, 156	.....	.....
.....	5, 567, 971	5, 567, 971	112, 343, 847	112, 343, 847	117, 911, 818
1850	12, 801, 093	.....	69, 375, 741	.....	.....
.....	18, 369, 064	18, 369, 064	181, 719, 588	181, 719, 588	200, 088, 652
1855	21, 864, 762	.....	75, 775, 220	.....	.....
.....	40, 233, 826	40, 233, 826	257, 494, 808	257, 494, 808	297, 728, 634
1860	53, 343, 918	.....	104, 368, 446	.....	.....
.....	93, 577, 744	93, 577, 744	361, 863, 254	361, 863, 254	455, 440, 998
1865	178, 470, 444	.....	133, 356, 875	.....	.....
.....	272, 048, 188	272, 048, 188	495, 220, 129	495, 220, 129	767, 268, 317
1870	117, 527, 424	.....	92, 071, 717	.....	.....
.....	339, 575, 612	339, 575, 612	587, 291, 846	587, 291, 846	976, 867, 458
1871	45, 143, 424	.....	24, 093, 184	.....	.....
.....	434, 719, 036	434, 719, 036	611, 385, 030	611, 385, 030	1, 046, 104, 066
1872	38, 915, 060	.....	17, 955, 684	.....	.....
.....	478, 634, 096	478, 634, 096	629, 340, 714	629, 340, 714	1, 102, 974, 810
1873	51, 452, 254	.....	19, 381, 664	.....	.....
.....	525, 086, 350	525, 086, 350	648, 722, 378	648, 722, 378	1, 163, 808, 728
1874	101, 421, 459	.....	29, 258, 094	.....	.....
.....	626, 507, 809	626, 507, 809	677, 980, 472	677, 980, 472	1, 304, 488, 281
1875	59, 607, 863	.....	23, 710, 074	.....	.....
.....	626, 115, 672	626, 115, 672	701, 690, 546	701, 690, 546	1, 387, 806, 218
.....	686, 115, 672	.....	701, 690, 546	.....	.....



CORN AND WHEAT EXPORTS OF FIFTY YEARS.

1825 to 1875.



The corn and corn-meal exported are equivalent to the following aggregate of bushels of corn :

Year.	QUANTITY.				
	Corn.		Corn-meal.		Total.
	Bushels.	Bushels.	Bushels.	Bushels.	
1830	3, 530, 710	-----	3, 133, 632	-----	6, 664, 342
1835	2, 568, 946	6, 099, 656	3, 269, 532	6, 403, 164	12, 502, 820
1840	6, 099, 656 1, 184, 973	7, 284, 629	6, 403, 164 3, 375, 720	9, 778, 884	17, 063, 513
1845	7, 284, 629 3, 474, 109	10, 758, 738	9, 778, 884 4, 530, 996	14, 309, 880	25, 068, 618
1850	10, 758, 738 43, 822, 153	54, 580, 891	14, 309, 880 9, 974, 800	24, 284, 680	78, 865, 571
1855	54, 580, 891 23, 905, 196	78, 486, 087	24, 284, 680 4, 485, 824	28, 770, 504	107, 256, 591
1860	78, 486, 087 27, 597, 896	106, 083, 983	28, 770, 504 5, 165, 368	33, 935, 872	140, 019, 855
1865	106, 083, 983 52, 612, 028	158, 696, 011	33, 935, 872 4, 706, 428	38, 642, 300	197, 338, 311
1870	158, 696, 011 47, 993, 276	206, 689, 287	38, 642, 300 5, 420, 096	44, 062, 396	250, 751, 683
1871	206, 689, 287 9, 826, 309	216, 515, 596	44, 062, 396 850, 564	44, 912, 960	261, 428, 556
1872	216, 515, 596 34, 491, 650	251, 007, 246	44, 912, 960 1, 235, 360	46, 148, 320	297, 155, 566
1873	251, 007, 246 38, 541, 930	289, 549, 176	46, 148, 320 1, 612, 444	47, 760, 764	337, 309, 940
1874	289, 549, 176 34, 434, 606	333, 983, 782	47, 760, 764 1, 551, 228	49, 311, 992	373, 295, 774
1875	333, 983, 782 28, 858, 420	352, 842, 202	49, 311, 992 1, 166, 616	50, 478, 608	403, 320, 810
	352, 842, 202		50, 478, 608		

The value of corn and corn-meal, represented in connection with wheat in the second figure of the diagram, is as follows for the several periods:

Year.	Corn.		Corn-meal.		Total value of corn and corn-meal.	
	Value.	Value.	Value.	Value.		
1830.....	\$2,019,926		\$2,404,371		\$4,424,297	
1835.....	1,804,711		2,731,077		4,535,788	
	3,824,637	\$3,824,637	5,135,448	\$5,135,448	8,960,085	\$8,960,085
1840.....	873,104		3,471,215		4,344,319	
	4,697,741	4,697,741	8,606,663	8,606,663	13,304,404	13,304,404
1845.....	1,755,602		3,037,021		4,792,623	
	6,453,343	6,453,343	11,643,684	11,643,684	18,097,027	18,097,027
1850.....	37,731,263	37,731,263	20,627,936	20,627,936	58,359,199	58,359,199
1855.....	17,712,699		4,147,318		21,860,017	
	55,443,962	55,443,962	24,775,254	24,775,254	80,219,216	80,219,216
1860.....	19,769,181		4,917,515		24,686,696	
	75,233,143	75,233,143	29,692,769	29,692,769	104,925,912	104,925,912
1865.....	34,903,365		5,323,270		40,226,635	
	110,136,508	110,136,508	35,016,039	35,016,039	145,152,547	145,152,547
1870.....	47,143,817		7,345,448		54,488,265	
	157,250,325	157,250,325	42,361,487	42,361,487	199,611,812	199,611,812
1871.....	7,452,997		951,830		8,410,827	
	164,739,322	164,739,322	43,313,317	43,313,317	208,052,639	208,052,639
1872.....	23,984,365		1,214,999		25,199,364	
	188,723,687	188,723,687	44,528,316	44,528,316	233,252,003	233,252,003
1873.....	23,794,694		1,474,827		25,269,521	
	212,518,381	212,518,381	46,003,143	46,003,143	258,521,524	258,521,524
1874.....	24,769,951		1,529,399		26,299,350	
	237,258,332	237,258,332	47,532,542	47,532,542	284,820,874	284,820,874
1875.....	24,456,937		1,290,533		25,747,470	
	261,745,269	261,745,269	48,823,075	48,823,075	310,568,344	310,568,344

5. *Sugar-supply of twenty-five years*, with a comparison of quantities of native, and foreign. This diagram represents the annual production of Louisiana, together with the imports entering annually into consumption, by separate tints of color, on the scale of 200,000,000 pounds per inch. It shows that in 1850 half the requisite supplies were produced in Louisiana; now, from the vast increase in consumption, and decrease in production, less than one-tenth of our wants are supplied at home. The figures accompanying this diagram, which is not here produced, are as follows:

THE COTTON CROP OF TEN YEARS.

Effect of quantity upon value.

SCALE.
Light lines, 1 inch to $\frac{1}{2}$ million bales.
Dark lines, 1 inch to 50 million dolls.

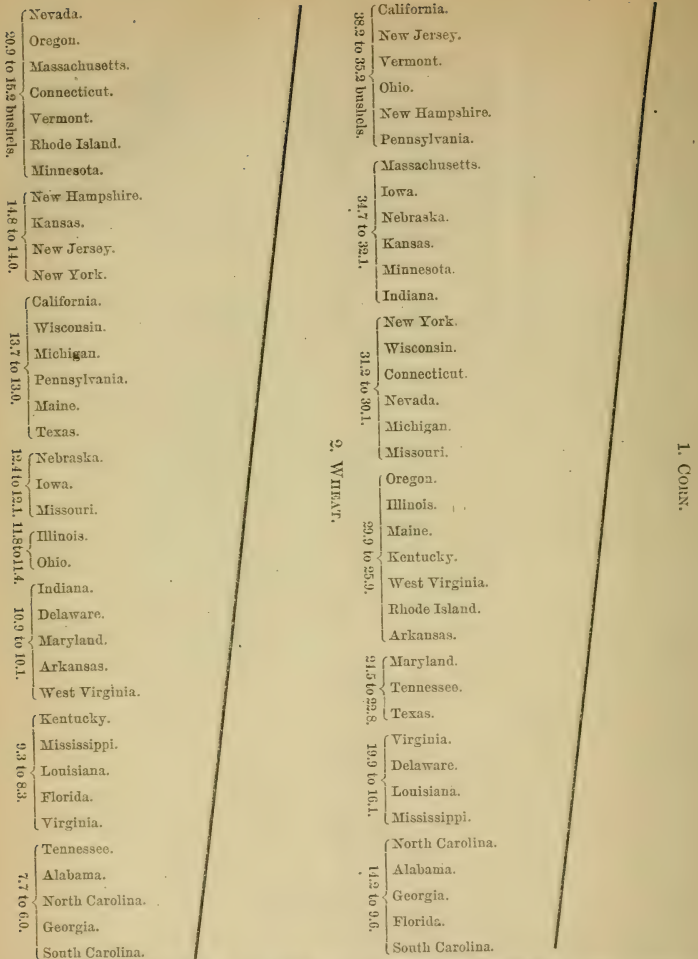
QUANTITY.	VALUE.
2,193,987 bales.	\$440,728,108 @ 43.2c.
2,019,774 bales.	\$285,515,252 @ 30.4c.
2,593,993 bales.	\$234,004,108 @ 19.4c.
2,439,039 bales.	\$285,806,590 @ 25.2c.
3,154,946 bales.	\$346,223,774 @ 23.6c.
4,352,317 bales.	\$301,550,283 @ 14.9c.
2,974,351 bales.	\$266,933,130 @ 19.3c.
3,930,508 bales.	\$345,432,695 @ 18.9c.
4,170,388 bales.	\$300,580,715 @ 15.5c.
3,832,991 bales.	\$269,133,463 @ 15.1c.



Years.	Louisiana.	Total.	Years.	Louisiana.	Total.
	<i>Pounds.</i>	<i>Pounds.</i>		<i>Pounds.</i>	<i>Pounds.</i>
1850.....	242,881,150	443,908,572	1864.....	7,668,200	611,284,468
1851.....	272,029,050	642,792,597	1865.....	17,250,000	594,330,143
1852.....	370,224,100	815,663,455	1866.....	47,150,000	1,012,799,904
1853.....	505,222,600	944,814,232	1867.....	43,294,050	870,526,017
1854.....	398,630,250	792,610,363	1868.....	96,294,400	1,195,120,413
1855.....	266,141,050	695,021,736	1869.....	100,153,500	1,309,847,125
1856.....	85,072,400	597,638,166	1870.....	166,613,150	1,306,202,065
1857.....	321,651,550	1,078,450,344	1871.....	147,730,150	1,327,456,300
1858.....	416,640,400	853,994,264	1872.....	124,798,000	1,565,760,616
1859.....	255,116,000	870,540,053	1873.....	102,922,700	1,525,794,971
1860.....	263,071,700	919,346,722	1874.....	134,504,691	1,703,193,954
1861.....	528,321,500	1,251,620,551			
1862.....		530,832,412			
1863.....		498,846,005	Total	4,913,980,591	23,960,395,437

6. *The cotton-crop of ten years—effect of quantity upon value.*—This brings in juxtaposition the aggregate quantity and value of the crop for each year since 1865, one inch in length meaning a half million of bales or \$50,000,000. It shows that when the quantity rose from 3,154,946 bales in 1869 to 4,352,317 bales in 1870, the price declined from 23.6 to 14.9 cents, so that the large crop brought \$44,673,491 less than the medium crop preceding. The next year the crop declined to 2,974,351 bales, and the price rose to 19.3 cents. The high price of the first year was, of course, the result of the cotton-famine of the war-period.

7. *Average yield per acre, 1866–1875.*—The estimates of area and production furnish means of making averages for a period which are truer and more instructive than the fluctuating averages of separate years. Those averages are not necessarily indices of fertility of soil, as Massachusetts, utterly insignificant in corn-production, stands far higher than Illinois. Fertilizers and special culture give larger results per acre than the richest soils. Illinois probably stands lower for this period of nine years than for any former period, having suffered for several seasons of drought and other unpropitious meteorological conditions. The average yields of corn and wheat are as follows:



8. *Aggregate value of principal crops*, being an average from 1866 to 1874, inclusive. This diagram is a line-illustration on the scale of 100,000,000 to the square inch, which shows that corn leads all our crops, hay next, (grass as pasturage not included,) and wheat and cotton are almost exactly equal. These averages are as follows:

Corn.....	\$549,238,907	Potatoes.....	\$76,356,914
Hay.....	343,111,450	Tobacco.....	34,439,809
Wheat.....	308,983,272	Barley.....	23,374,788
Cotton.....	308,590,811	Rye.....	18,695,826
Oats.....	123,867,426	Buckwheat.....	12,943,912

1874.

650 mil. dols.
1,300 " bu.

600 mil dols
1,200 " bu

550 mil dols
1,100 " bu.

500 mil. dols
1,000 " bu.

SCALE:

Quantity of Corn
Value "

450 mil dols.
900 " bu.

Quantity of Wheat
Value "

400 mil dols
800 " bu.

Quantity of Oats
Value "

350 mil dols.
700 " bu

Quantity of potatoes
Value "

300 mil. dols.
600 " bu.

250 mil. dols.
500 " bu.

200 mil. dols.
400 " bu.

150 mil. dols.
300 " bu.

100 mil dols.
200 " bu.

50 mil. dols.
100 " bu.

AGGREGATE PRODUCT OF CORN, WHEAT, OATS, AND POTATOES.

Effect of quantity on value.

	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	
										650 mil. dols.
										1,300 " bu.
										600 mil. dols.
										1,200 " bu.
										550 mil. dols.
										1,100 " bu.
										500 mil. dols.
										1,000 " bu.
										450 mil. dols.
										900 " bu.
										400 mil. dols.
										800 " bu.
										350 mil. dols.
										700 " bu.
										300 mil. dols.
										600 " bu.
										250 mil. dols.
										500 " bu.
										200 mil. dols.
										400 " bu.
										150 mil. dols.
										300 " bu.
										100 mil. dols.
										200 " bu.
										50 mil. dols.
										100 " bu.

SCALE:

Quantity of Corn
Value "

Quantity of Wheat
Value "

Quantity of Oats
Value "

Quantity of potatoes.
Value "



IMMIGRATION OF SEVEN YEARS.

Comparison of its sources.



1. Aggregate for all countries	2,531,569
2. Great Britain and Ireland	993,105
3. Germany	869,000
4. North America	213,958
5. Sweden	93,053
6. Norway	78,036

7. Asia	76,690
8. France	47,252
9. Austro-Hungary	27,750
10. Italy, including Sicily and Malta	25,935
11. Switzerland	23,469
12. Denmark	21,977

13. Netherlands	12,973
14. Russia	7,561
15. Poland	7,370
16. Belgium	6,847
17. Spain	5,005
18. Portugal	1,390

9. *Aggregate product of corn, wheat, and potatoes—effect of quantity upon value.*—This diagram shows the course of production through eight years. The scale is arranged to illustrate quantities by lines representing one hundred, two hundred, up to thirteen hundred millions of bushels, and when used to illustrate value the same lines mean fifty, one hundred, up to six hundred and fifty millions of dollars. Tracing the line representing corn, starting at less than nine hundred million bushels, it falls one hundred millions in 1869, and at 1870 and 1872, respectively, it nearly reaches eleven hundred million. Then following the upper line, showing the value of corn, nearly \$600,000,000 in 1866—a rise in value attends a decline in quantity, and *vice versa*, the only exception being in 1871, when the surplus of the preceding year made the supply a very full one, while the great crop of 1872 struck with panic the corn-markets, and completely demoralized prices. The prices of corn are controlled almost exclusively by the quantity produced, as the market cannot be “cornered,” and the export of 3 per cent. is scarcely a disturbing element; in this instance, foreign demand does not fix the prevailing home-price. With wheat it is different, as the lines show, in some years prices continuing to rise with a rise in quantity, caused by poor crops in Europe.

10. *Wages of farm-labor—monthly rate without board, 1866 and 1875.*—This diagram shows the monthly rate of each State, in both the years named, from the exhaustive investigations of the Department. The scale of line-illustrations is \$10 per inch. There is shown a decline in wages, except in some of the Southern States, where labor is becoming more efficient and valuable, and in Oregon, where a scarcity exists. The figures are as follows:

States.	1866.	1875.	States.	1866.	1875.
Maine.....	\$27 00	\$25 40	Louisiana.....	\$20 50	\$18 40
New Hampshire.....	32 74	28 57	Texas.....	19 00	19 50
Vermont.....	32 84	29 67	Arkansas.....	24 21	20 50
Massachusetts.....	38 94	31 87	Tennessee.....	19 00	15 20
Rhode Island.....	34 40	30 00	West Virginia.....	25 35	20 75
Connecticut.....	31 25	28 25	Kentucky.....	20 23	18 12
New York.....	29 57	27 14	Ohio.....	28 46	24 05
New Jersey.....	32 27	30 71	Michigan.....	31 26	28 22
Pennsylvania.....	29 91	25 89	Indiana.....	27 71	24 20
Delaware.....	24 93	20 33	Illinois.....	28 54	25 20
Maryland.....	30 36	20 02	Wisconsin.....	30 84	25 50
Virginia.....	14 82	14 84	Minnesota.....	31 05	26 16
North Carolina.....	13 46	13 46	Iowa.....	28 34	24 35
South Carolina.....	12 00	12 84	Missouri.....	26 75	19 40
Georgia.....	15 51	14 40	Kansas.....	31 03	23 20
Florida.....	18 00	15 50	Nebraska.....	38 37	24 00
Alabama.....	13 40	13 60	California.....	45 71	44 50
Mississippi.....	16 72	16 40	Oregon.....	35 75	38 25

11. *Immigration of seven years—comparison of its sources.*—In further illustration of labor interests, this diagram shows the sources of our supply from other countries. Great Britain furnishes 39 per cent. and Germany 34—all other nationalities little more than a fourth of the whole.

12. *Comparative area of the public-land States.*—This diagram illustrates the superficial area of each State by square figures drawn to a scale of 25,000,000 acres per square inch. The proportion surveyed in 1874 is indicated by shading, as also the area actually appropriated up to 1870.

The figures are as follows:

States and Territories.	Area in acres.	Acres surveyed.	Acres appropriated.
California	120,947,840	32,805,776	20,877,662
Dakota Territory	96,596,123	13,863,913	5,835,604
Montana Territory	92,016,640	6,784,481	5,179,821
New Mexico Territory	77,568,640	5,486,185	6,864,082
Arizona Territory	72,906,240	3,135,753	4,050,350
Nevada	71,737,600	8,198,194	4,669,353
Colorado Territory	66,880,000	15,683,086	4,303,329
Wyoming Territory	62,645,068	4,748,841	3,480,281
Oregon	60,975,360	15,255,617	9,515,744
Idaho Territory	58,228,160	4,014,953	3,102,407
Utah Territory	51,065,042	5,984,792	5,315,086
Minnesota	53,459,840	35,897,912	19,516,340
Kansas	52,043,520	45,770,685	10,544,439
Nebraska	48,636,800	32,372,410	8,869,943
Washington Territory	44,796,160	10,190,046	3,556,967
Indian Territory	44,154,240	22,832,725	.....
Missouri	41,234,000	41,234,000	40,549,368
Florida	37,931,520	29,345,870	20,643,611
Michigan	36,123,640	36,123,640	32,468,110
Illinois	35,462,400	35,462,400	33,462,400
Iowa	33,228,800	35,228,800	34,036,220
Wisconsin	34,511,360	34,511,360	26,118,729
Alabama	34,462,080	34,462,080	28,522,448
Arkansas	33,406,720	33,406,720	22,463,872
Mississippi	30,179,840	30,179,840	25,531,387
Louisiana	26,461,440	23,909,253	20,033,897
Ohio	25,576,960	25,576,960	25,576,960

13. *Aggregate value of farm animals—average from 1846 to 1874, inclusive.*—This diagram represents these values as follows: Cattle, \$616,214,801; horses, \$600,782,233; mules, \$108,033,293; swine, \$146,417,611; sheep, \$94,491,942.

CHARTS.—Several charts embody the numbers and prices of farm animals, taken from the statistical estimates of 1876, which are as follows:

Table showing the estimated value and average price of horses, mules, and cows and other cattle, January, 1876.

States.	Horses.		Mules.		Milch cows.		Oxen and other cattle.	
	Value.	Average price.	Value.	Average price.	Value.	Average price.	Value.	Average price.
Maine	\$6,463,954	\$81.41	.....	.....	\$6,079,100	\$37.00	\$7,155,336	\$35.44
New Hampshire	3,804,180	80.94	.....	.....	3,780,700	38.50	4,498,160	38.12
Vermont	6,291,380	83.21	.....	.....	7,060,150	33.70	3,827,565	29.33
Massachusetts	9,416,718	89.94	.....	.....	6,780,699	48.33	5,710,800	47.59
Rhode Island	1,438,669	97.87	.....	.....	795,600	39.00	795,520	49.72
Connecticut	4,197,354	82.14	.....	.....	4,505,297	43.33	4,185,188	36.68
New York	61,119,000	90.00	\$1,819,475	\$98.35	56,111,250	37.50	21,122,920	31.85
New Jersey	12,824,188	110.84	1,934,800	123.32	6,429,213	44.37	3,037,800	36.60
Pennsylvania	49,557,970	84.70	2,528,745	96.15	29,027,160	34.68	20,556,143	29.03
Delaware	1,635,620	83.45	380,000	95.00	736,000	32.00	783,624	24.72
Maryland	8,779,710	83.22	1,164,460	105.86	3,052,217	30.31	2,728,391	22.87
Virginia	13,551,397	69.53	2,550,880	85.60	5,168,790	22.77	6,701,850	16.86
North Carolina	10,473,309	74.97	4,267,318	82.54	3,111,480	15.48	3,191,508	10.19
South Carolina	5,040,202	88.58	4,204,929	94.07	3,146,175	19.75	2,182,523	11.69
Georgia	9,389,471	79.37	8,380,944	87.12	4,512,000	17.02	3,572,019	8.91
Florida	1,306,274	78.22	879,840	91.65	976,616	14.62	2,958,076	8.14
Alabama	7,449,984	71.36	8,132,260	80.20	3,400,414	20.27	4,186,167	12.79
Mississippi	6,775,164	76.04	9,328,427	97.07	3,671,830	21.03	3,639,135	11.85
Louisiana	4,484,914	58.78	6,708,404	83.96	1,855,610	20.71	2,007,792	11.68
Texas	25,554,168	33.17	5,932,413	53.59	7,661,572	15.72	22,429,209	9.57
Arkansas	8,594,901	54.09	5,629,500	67.50	2,606,580	16.20	2,775,000	10.62
Tennessee	19,919,320	62.44	6,910,858	67.82	4,701,331	20.83	3,945,903	12.19
West Virginia	6,651,326	59.44	163,392	68.08	3,234,135	25.77	5,087,376	21.63
Kentucky	20,766,018	56.94	5,009,050	58.93	6,836,918	27.94	8,236,144	21.14

AGGREGATE VALUE OF FARM ANIMALS.

Annual average from 1866 to 1874, inclusive

Cattle	\$646,214,801
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Horses	600,782,233
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Swine	146,417,611
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Mules	108,033,793
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Sheep	94,491,942
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Table showing the estimated value and average price of horses, &c.—Continued.

States.	Horses.		Mules.		Milch cows.		Oxen and other cattle.	
	Value.	Average price.	Value.	Average price.	Value.	Average price.	Value.	Average price.
Ohio	\$52,601,712	\$69.14	\$1,909,060	\$72.04	\$26,433,440	\$32.65	\$21,510,063	\$24.87
Michigan	24,437,839	82.31	365,256	96.12	12,169,070	33.70	10,803,500	26.35
Indiana	41,725,056	61.76	4,187,864	71.71	11,916,260	27.40	15,175,695	19.65
Illinois	65,229,075	59.75	7,929,207	71.37	20,852,090	29.05	27,721,980	21.54
Wisconsin	23,608,305	67.05	443,352	85.29	12,679,500	26.75	9,153,671	20.39
Minnesota	12,945,516	75.09	306,528	95.79	5,881,865	25.19	6,606,475	20.05
Iowa	43,774,614	63.83	3,041,770	82.21	16,726,420	26.90	19,095,012	20.91
Missouri	26,400,100	45.40	7,070,986	56.03	9,140,652	20.86	14,143,844	17.38
Kansas	11,260,899	49.63	1,333,080	64.40	5,600,232	23.76	9,213,490	18.95
Nebraska	4,713,618	69.42	450,800	98.00	1,676,973	28.09	1,804,044	20.76
California	9,514,778	45.46	1,497,680	77.20	11,445,148	31.46	21,586,000	20.08
Oregon	3,900,952	42.68	169,016	45.68	1,759,575	21.75	1,754,400	12.75
Nevada	588,600	54.00	85,800	78.00	326,700	33.00	980,700	21.00
The Territories	6,330,500	55.00	1,859,000	71.50	7,988,750	27.50	14,761,080	18.78
Total	632,446,985	.....	106,565,114	.....	320,316,728	.....	319,623,509	.....
Grand average of prices .....	.....	64.96	.....	75.33	.....	28.89	.....	19.04

Table showing the estimated number, average price, and value of sheep and swine January, 1876.

State.	Sheep.			Swine.		
	Number.	Average price.	Value.	Number.	Average price.	Value.
Maine	525,900	\$3.78	\$1,987,902	58,800	\$11.66	\$685,608
New Hampshire	242,400	2.70	654,480	37,300	16.20	604,260
Vermont	490,500	3.74	1,834,470	51,800	12.19	631,442
Massachusetts	76,300	3.63	276,969	75,600	18.03	1,363,068
Rhode Island	25,300	3.96	100,188	16,300	17.05	277,915
Connecticut	92,500	4.18	386,650	57,900	16.73	968,667
New York	1,936,500	3.95	7,649,175	568,700	11.39	6,477,493
New Jersey	125,800	5.01	630,258	153,000	13.83	2,115,990
Pennsylvania	1,640,500	3.58	5,872,990	875,000	11.50	10,062,500
Delaware	23,600	3.67	86,612	46,700	10.61	495,487
Maryland	141,200	3.89	549,268	233,500	7.10	1,657,850
Virginia	356,400	2.93	1,044,252	589,800	4.45	2,624,610
North Carolina	283,900	1.58	448,562	758,300	4.01	3,040,783
South Carolina	142,700	1.81	258,287	275,900	4.11	1,133,949
Georgia	371,200	1.73	642,176	1,360,700	3.91	5,320,337
Florida	37,800	1.94	73,332	175,400	2.26	396,404
Alabama	185,900	1.93	359,787	755,900	3.99	3,016,041
Mississippi	151,800	1.81	274,758	792,900	4.31	3,417,399
Louisiana	68,800	2.04	140,332	222,600	3.98	885,948
Texas	1,691,400	2.00	3,382,800	1,090,000	4.09	4,458,100
Arkansas	192,400	2.01	386,724	901,200	3.91	3,523,692
Tennessee	341,700	2.11	720,987	1,026,400	5.22	5,357,808
West Virginia	544,500	2.55	1,388,475	248,400	5.38	1,336,392
Kentucky	683,600	2.85	1,948,260	1,604,300	5.51	8,839,693
Ohio	4,546,600	2.72	12,366,752	1,596,100	8.06	12,864,566
Michigan	3,450,600	2.65	9,144,090	459,700	7.93	3,645,421
Indiana	1,250,000	2.62	3,275,000	2,136,000	7.70	16,447,200
Illinois	1,311,000	2.41	3,159,510	2,640,100	8.63	22,784,063
Wisconsin	1,162,800	2.74	3,186,072	540,700	7.58	4,008,506
Minnesota	190,200	2.63	500,226	213,400	6.99	1,491,666
Iowa	1,663,900	2.66	4,425,974	3,296,200	8.08	26,633,296
Missouri	1,224,200	1.86	2,288,612	1,874,300	5.94	11,133,342
Kansas	123,900	2.80	346,920	246,500	8.91	2,196,315
Nebraska	48,900	2.77	135,453	80,900	7.58	613,222
California	6,750,000	2.02	13,635,000	363,360	7.17	2,604,861
Oregon	710,500	1.99	1,413,895	181,500	4.41	800,415
Nevada	20,900	2.60	54,340	5,200	9.00	46,800
The Territories	3,049,200	2.80	8,537,760	116,500	8.75	1,019,375
Total	35,935,309	.....	93,666,318	25,726,800	.....	175,070,484
Grand average of prices .....	.....	2.60	.....	.....	6.80	.....

The comparative value of horses and cows in the several States is thus presented:

\$30 to \$40. New Jersey. Massachusetts. Connecticut. Rhode Island.	\$40 to \$45. Nevada. California. Vermont. New York. Pennsylvania. New Hampshire. Maine.	\$45 to \$50. Michigan. Ohio. Delaware. The Territories. Maryland. Nebraska. Illinois. Indiana. Kentucky. West Virginia.	\$50 to \$55. Oregon. Wisconsin. Iowa. Minnesota. Kansas. Virginia.	\$55 to \$60. Missouri. Louisiana. South Carolina. Mississippi. Tennessee. Georgia. Alabama.	\$60 to \$100. Arkansas. North Carolina. Florida. Texas.	\$120 to \$100. New Jersey. Massachusetts. Rhode Island. Connecticut. Florida.	\$100 to \$80. Pennsylvania. Georgia. South Carolina. New York. Vermont. Mississippi.	\$80 to \$60. Maryland. Louisiana. Maine. New Hampshire. North Carolina. Delaware. Alabama.	\$60 to \$70. Michigan. Virginia. Ohio. Tennessee. Wisconsin. Minnesota. Arkansas. Nebraska.	\$70 to \$65. West Virginia. Indiana. Kentucky. Iowa. Illinois.	\$65 to \$50. Kansas. Missouri. The Territories.	\$50 to \$30. Nevada. Oregon. California. Texas.
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I. HORSES.

2. COWS.

In connection with these charts are type specimens (in lithograph, black and tint) of breeds of farm-animals most popular and generally distributed. These are—

- Shorthorn bull, (Bates,) Duke of Airdrie, (12,730.)
- Shorthorn cow, (Bates,) Dutchess of Geneva.
- Shorthorn bull, (Booth,) Breastplate, (11,431.)
- Shorthorn grade steer.

- e. Devon bull, Huron.
 f. Jersey bull, King of Prairie.
 g. Dutch cow, Infrau.
 h. Ayrshire grade, "Old Creamer."

The second is the famous cow that brought, at auction, \$40,600; the last, the cow that gave 100 pounds of milk, daily, for thirty days.

Another series of charts illustrates the statistics of agricultural education, accompanied by the following illustrations (wood engraving upon lithographic tint) of college-buildings, as follows:

- a. College of Agriculture and the Mechanic Arts at Hanover, N. H.
 b. Institute of Technology at Boston, Mass.
 c. Agricultural College at Amherst, Mass.
 d. College of Agriculture, (Cornell University,) Ithaca, N. Y.
 e. Agricultural and Mechanical College, Columbus, Ohio.
 f. Industrial University at Urbana, Ill.
 g. "Ashland," homestead of Henry Clay, regents' residence, Kentucky University, Lexington, Ky.
 h. College of Agriculture at Berkeley, Cal.
 i. Female College, University of Wisconsin, Milwaukee, Wis.
 k. College of Agriculture, Lincoln, Neb.
 l. Industrial University, Fayetteville, Ark.

A portion of these statistics of our industrial system are given in the following tables:

State.	Number of acres donated by Congress.	Number of acres sold.	Number of professors and assistants in the agricultural and mechanical college.	Number of students in the agricultural and mechanical college.	Number of students in the university with which the college is connected.
Alabama	240,000	240,000	8	88	
Arkansas	150,000	150,000	8	9	248
California	150,000	150,000	27	85	231
Connecticut	180,000	180,000	29	224	1,051
Delaware	90,000	90,000	8	42	
Florida	90,000	90,000			
Georgia	270,000	270,000	15	344	487
Illinois	480,000	454,560	24	131	374
Indiana	390,000	390,000	7		57
Iowa	240,000	63,025	17	277	
Kansas	90,000	57,495	15	237	
Kentucky	330,000	330,000	8	95	260
Louisiana	210,000	210,000	6	925	
Maine	210,000	210,000	8	115	
Maryland	210,000	210,000	5	52	
Massachusetts	360,000	360,000	48	391	
Michigan	240,000	75,584	14	156	
Minnesota	120,000	64,997	10	9	237
Mississippi	210,000	210,000	11	5	292
Missouri	330,000	1,571	19	142	491
Nebraska	30,000		4	20	132
Nevada	90,000		14	29	479
New Hampshire	150,000	150,000	11	57	188
New Jersey	210,000	210,000	30	73	532
New York	990,000	580,800	5	7	70
North Carolina	270,000	270,000	11	100	
Ohio	630,000	630,000	6	60	155
Oregon	90,000	700	12	148	
Pennsylvania	780,000	780,000	13	40	255
Rhode Island	120,000	120,000	2	20	209
South Carolina	180,000	180,000	16	53	315
Tennessee	300,000	300,000			
Texas	180,000	180,000	7	14	153
Vermont	150,000	150,000	26	423	
Virginia	300,000	300,000	5	15	125
West Virginia	150,000	150,000	14	17	345
Wisconsin	240,000	187,597			
Total	9,510,000	7,996,329	463	3,703	6,616

From the above statement it appears that 84 per cent. of the donated lands have been sold; and the following shows the property already invested in industrial education aggregates seventeen and a half millions:

States.	Acres in farms.	Value of farms.	Value of buildings.	Value of all college property.
Alabama.....	200	\$2,000	\$100,000	\$327,500
Arkansas.....	160	12,000	5,000	300,000
California.....	200			1,037,500
Connecticut.....			225,000	614,000
Delaware.....	70	15,000	50,000	139,000
Florida.....				100,134
Georgia.....	70	2,500	200,000	346,000
Illinois.....	623	60,000	200,000	866,308
Indiana.....	184	60,000	25,000	510,000
Iowa.....	870	10,584	237,000	968,899
Kansas.....	415	3,000	31,000	458,782
Kentucky.....	433	130,000	120,000	311,000
Maine.....	370		65,000	258,620
Maryland.....	270	13,500	60,000	210,000
Massachusetts.....	383	37,500	163,500	1,460,627
Michigan.....	676	10,143	109,500	929,699
Minnesota.....	143	8,500	1,202	357,250
Mississippi.....	310	5,100	100,000	229,515
Missouri.....	600	60,000	75,000	
Nebraska.....	480			468,000
New Hampshire.....	163	15,000	50,000	240,000
New Jersey.....	99	30,000	75,000	292,200
New York.....	200	40,000	560,000	2,651,998
Ohio.....	320	112,000		904,000
Oregon.....	36	5,000	6,000	239,000
Pennsylvania.....	600	59,136	300,000	897,589
Rhode Island.....				56,000
South Carolina.....	116	9,000	35,000	200,800
Tennessee.....	260	30,000	53,000	397,190
Texas.....	600			291,240
Vermont.....				416,972
Virginia.....	369	39,740	89,000	491,448
West Virginia.....	25		80,000	155,000
Wisconsin.....	234		164,000	359,204
Total.....				17,535,475

To conclude the series of exhibits, the smaller diagrams, the charts in the show-frame illustrating the above-named branches of statistical exposition, together with further letter-press illustration of the real extent of our agricultural resources and present production, are gathered together in the form of a statistical album, for preservation of the substance of the exhibits, and as a fragmentary record of a century's progress and memorial of the great centennial anniversary.

DIGEST OF CROP-RETURNS FOR JUNE.

WINTER-WHEAT.

In the Northern States the conditions of weather, in April and May, were generally favorable for the grain-crop, and it has suffered very little from insect attacks or other injuries; but, though the crop of winter-wheat on the ground is generally thrifty, yet, owing to extensive injuries from the open winter, the prospect is not favorable for a large yield. Among the States in the entire northern section, which grow

winter-wheat to any extent, Michigan alone comes up to average. Previous reports indicated that that State was favored above the others with a more permanent covering of snow. New York averages about 18 below good condition. In several counties the fact is noted that drilled wheat stood the winter better, and was generally more prosperous than that sown broadcast; also, that while the crop was badly winter-killed on poor or poorly cultivated soil it came through unharmed on that well fertilized and cultivated. The only counties reporting above average are Wayne and Erie, 110, and Ontario and Montgomery, 105; which, except the last-named, are among the heavier counties. The heaviest winter-wheat county, Monroe, returns 90; Livingston, the next heaviest, 50, though that sown early on well-drained land is promising; Genesee is 55.

The average condition in Pennsylvania is 93. Lancaster, the great wheat county of the State, returns 105. "The Fultz wheat has the best appearance wherever it is sown, and the general feeling among farmers is that it is the wheat for Lancaster County." The old Mediterranean wheat, long grown there, "does not make a full crop any more, and is more subject to the fly and also to lodge." York, the next county in production, also promises above average. Delaware, Tioga, Bedford, McKean, and Fulton report 110; Forest, 105; 16 counties, 100; the remainder range from 95 down to 50, Lawrence, Columbia, and Montour being at the latter figure.

In the South Atlantic States the mild winter has been followed generally by very favorable weather, resulting in a condition of extraordinary promise. In Delaware, 105, and Maryland, 108, there are no drawbacks of any kind reported, and no counties below average, the range being from 100 to 120. In Virginia, 112, only seven returns out of sixty-eight fall below average. A hard freeze about the last of April did considerable injury to a previously very promising crop in several counties. Injuries from the presence of the fly are noted in Fairfax, King George, Madison, Clarke, James City, and Middlesex. They are not represented as serious except in Clarke, and even there have not reduced the promise below average. Rust had appeared in Prince William, Richland, Lancaster, Middlesex, and Dinwiddie, but was mostly confined to the blade, and, except some pieces sown late, the crop was too far advanced before its appearance to be seriously injured.

In North Carolina, 104, while in a large majority of the returns the condition ranges from 100 up to 125, it has been reduced in Moore by the fly, in Lincoln by an insect never before seen, resembling the cabbage-louse; and in Gaston, Nash, Duplin, Stokes, Wilkes, and Lincoln by rust. In Person, where the condition is very fine, Fultz wheat is the favorite.

Farther south the rust has been more general and damaging. In Georgia it has reduced a very promising condition to 16 per cent. below average; in Alabama, 12 per cent. below; Mississippi, 25 per cent. below; and in Texas the grasshopper, to a small extent, and more generally the fly, have conspired with rust to bring the condition down to 21 below. In Arkansas, owing almost exclusively to rust, the condition is reduced to 73. Ravages of insects are noted only in Benton, in which both chinchies and the Hessian fly have been at work. In Tennessee, also, the complaint of rust is almost universal, but, being mainly confined to the blade, it has not reduced the condition below average.

West Virginia appears to have escaped all drawbacks, except slight injuries from winter-killing and a late freeze, and rises 6 per cent. above average. The crop in Kentucky suffered extensively from dry weather

in May. Owing to this cause chiefly it falls 8 per cent. below average. The presence of rust is noted in three counties, and there were slight injuries from winter-killing and freezes in the spring.

In the States bordering the Ohio on the north, as previously reported, the open, changeable winter was very disastrous to the crop, reducing the condition, with respect to promised yield, to 66 in Ohio and Indiana, and 78 in Illinois. The thriftiness of that which escaped winter-killing or freezing out is generally assumed, though "the fly and bug" are reported in Adams, and injuries from wet and freezing weather in Vinton and Wood, Ohio; from drought in Warwick and Dubois, Indiana; and from "the hard freeze in March" in Effingham and Williamson, Illinois.

Beyond the Mississippi, among the winter-wheat States, Missouri falls about two per cent. below average condition. The principal causes of reduction reported, are an unfavorable start, owing to the protracted drought last autumn; more or less injury by the fly in Douglas, Stone, Phelps, Dallas, and Wright; rust in Stone, McDonald, Johnson, Mississippi, and Reynolds; and chinchies in Shelby.

In Kansas, the condition is extraordinarily good; out of 42 returns all except 5 are above 100, and many of them range from 110 up to 200. In Shawnee, rust has reduced a fine promise to half a crop, and its appearance is noted in three or four other counties. The average for the State is 108. In Nebraska, which grows very little winter-wheat, the condition is 110.

Only three returns from California fall below average, the others ranging from 100 to 125. But two of the three, Santa Clara, 85, and Stanislaus, 75, being two of the heaviest wheat counties, the State average is brought down somewhat below 100. In the former county, while early-sown wheat is in good condition, "late will not yield more than half a crop;" in the latter "the fields are very foul, owing to excessive wet weather, and the heads have not filled well."

From Oregon, all returns are favorable, making the State average 104. The average condition for the entire country is little above 87.

NEW HAMPSHIRE.—*Rockingham*: Somewhat winter-killed.

VERMONT.—*Grand Isle*: Winter-killed.

CONNECTICUT.—*New London*: Somewhat winter-killed.

NEW YORK.—*Fates*: On ground well manured, doing nicely; on poor ground, badly winter-killed. *Albany*: Very spotted; a great portion very poor. Sown with a drill, on ground well cultivated and fertilized, it looks well. *Schoharie*: Badly winter-killed; not half a crop. *Steuben*: Badly injured by the open winter. *Washington*: Never looked poorer. *Livingston*: Sown early on dry land, looking very well; on clay and low lands, very poor. *Saratoga*: Considerably injured during the winter. *Wyoming*: Looking very poorly. *Genesee*: Badly winter-killed, but that left is doing finely. *Orange*: Injured by winter-killing. *Seneca*: An open winter with severe changes ruined many pieces. Spring-wheat is being substituted to a considerable extent. *Montgomery*: Improving greatly.

NEW JERSEY.—*Warren*: Largely winter-killed, but improved finely till the middle of May, when it was attacked by the old-fashioned bug in the straw. *Gloucester*: Looks well where there is a stand, but many fields have failed of this, and are full of sorrel.

PENNSYLVANIA.—*Delaware*: Quite safe to predict an unprecedented yield. *Perry*: On low and thin soil, badly hurt by the winter, and now being badly injured by the fly. *Tioga*: Favorable weather has advanced the crop far beyond expectation. *Wyoming*: Most of that put in with the drill looks well; 33 per cent. of that put in with the harrow either poor or a total loss. *Beaver*: The crop will be a loss to a majority of the farmers, but to those who manured the ground and put in the wheat in good order, it will yield a profit. *Clinton*: Many fields which in ordinary seasons would have made nothing, now bid fair to produce an average crop. *Clearfield*: Badly winter-killed; but owing to the fine weather the loss will be less than was anticipated. *Monroe*: Looks fine. *Bedford*: Fields that seemed very bare recovered so as to indicate a good crop. *Bucks*: Improved from 75 to 90. *Butler*: About half a crop. *Lekigh*: Hessian fly in some localities. *Lycoming*: On sandy land has come on amazingly, but will be ten per cent.

below average. *Armstrong*: Many fields bare and spotted, but some are extra good. *Columbia*: Winter-killed; cannot be more than half a crop. *Indiana*: Improved greatly, the latter part of May. The season has demonstrated that drilled wheat stands the winter best. *York*: Indications of a more than average crop. *Crawford*: Winter-killed to some extent; that left doing well. *Washington*: Many spotted fields. *Northampton*: Looks well.

DELAWARE.—*Kent*: Prospect of a fine crop.

MARYLAND.—*Caroline*: Never looked so well before. *Baltimore*: Prospect of a fine crop. *Montgomery*: Looks unusually well. *Howard*: Growing weather has brought it up to a good average. *Talbot*: Fine. *Dorchester*: Looks remarkably well. *Harford*: Looking remarkably well; promise of the largest crop for years. *Queen Anne*: The crop will be heavy, should it escape rust and lodging.

VIRGINIA.—*King and Queen*: The prospect most favorable. *Loudoun*: Remarkably good; a week earlier than last year, and promises threefold more. *Patrick*: The best ever seen; promise of a larger crop than ever made before. *New Kent*: Looks remarkably well, even on poor land. *Culpeper*: Finest prospect for many years up to the 25th of April; since then it has been going back, and the prospect now is that the crop will be cut short 25 per cent; attributed to the freeze the last of April. *Gloucester*: A little rust on the blade in exceptional cases, but a fair promise of a heavy crop. *Orange*: Unusually promising up to May 1st, when a frost injured it. *Carroll*: Exceedingly thrifty. *Halifax*: Luxuriant, and filling well. *Charlotte*: Looks remarkably well. *Fairfax*: A few backward fields somewhat injured by the fly, but the general prospect above average. *King George*: The early promise injured by the fly or some other insect. *Prince William*: The leaves spotted to some extent with rust. *Pulaski*: The stand rather thin, but a promise of a fine yield. *Richmond*: Has been most promising, but red rust has appeared. *Madison*: The fine promise injured by the cold spell the first of May, and by the fly; cannot be more than half a crop. *Middlesex*: Considerably damaged by the fly, and some appearance of rust. *Charles City*: Better than for ten years. *Clarke*: Seriously damaged by the Hessian fly, but promise of an average crop. *Floyd*: Very promising. *Wythe*: Never looked better. *Dinwiddie*: Considerable red rust on the blade, but the heads are filling well and the crop looking better than for five years. *Greenville*: Badly rusted in many places. *James City*: Some crops injured by the fly; others magnificent. *Elizabeth City*: More than an average yield is considered certain. *Lancaster*: Gave promise of a most abundant crop, but rust has made its appearance on the leaf, and may do material injury.

NORTH CAROLINA.—*Moore*: Damaged by a fly. *Transylvania*: Two or three weeks of dry weather will insure a liberal harvest. *Beaufort*: Very promising. *Gaston*: Highly promising until within ten days, since which rust has struck it on many farms. *Yancy*: Looks remarkably well. *Lincoln*: Great complaint of rust; also of ravages by an insect never before seen; it somewhat resembles the cabbage-louse. *Forsyth*: Never looked better. *Nash*: Rusted badly. *Duplin*: Very promising up to this week; now red rust is spreading rapidly. *Edgecomb*: The increase is 200 per cent. *Person*: Very fine; Fultz the great favorite. *Haywood*: The best promise for years at the first of May; considerably lessened by continuous wet through the month. *Stokes*: Rust has appeared on some of the most forward wheat. *Wilkes*: Looks fine, but red rust is appearing.

SOUTH CAROLINA.—*Chester*: Stalk and heads short, but well filled. *Lexington*: Some rust and mold, but fine crop—the best for years. *Clarendon*: Looks well, but some complaint of rust. *Laurens*: Some rust.

GEORGIA.—*Stewart*: A larger area and good crop, now being rapidly harvested. *Union*: Never so fine before; a large increase of acreage, and a promised yield greatly in excess of anything we have ever experienced. *Walker*: Being ruined by rust. *Walton*: Threatened with rust. *Carroll*: Injured by blade rust, causing the grain to shrink; also, by a fly boring into the joints. *Jefferson*: Good. *Henry*: The crop badly cut off by frost and red mold. *Rabun*: Very promising. *White*: Very promising. *Towns*: Very promising. *Dooly*: A fine prospect being injured by rust. *Gordon*: Red rust universal on the blade; none on the stalk. *Johnson*: Rust to some extent. *Gwinnett*: Rust will reduce the crop 33 per cent. *McDuffie*: Rust on the blade; none on the stalk; and the yield 10 to 20 per cent. greater than last year. *Butts*: Has suffered from red mold. *Madison*: Rust almost universal on stalk and leaf; some complaint of the fly. *Gilmer*: Looks well, but beginning to rust. *Heard*: Some red mold, but will be a fair crop. *Lawrens*: Very good. *Troup*: A red mold on the blade but not on the stem; damage uncertain. *Whitfield*: Greatly injured by rust. *Cobb*: Very promising until two weeks ago, when the rust appeared. *DeKalb*: Badly rusted on the blade. *Lincoln*: Fine.

ALABAMA.—*Shelby*: Materially damaged by rust and recent storms, reducing it from 120 to 91. *Blount*: Generally affected with rust on the blade, none on the stock. *Crenshaw*: Some rust; being harvested. *Perry*: Injured by rust. *Randolph*: Rust on the blade and in some instances on the straw. *Jackson*: Damaged by rust. *Russell*: Rusted badly in some localities; all cut, and some are threshing. *Calthoun*: Being

harvested; black rust throughout the county, on low and drained land, caused almost a failure. *De Kalb*: Badly injured by rust. *Jefferson*: Promising up to May 1st, when the blade rust appeared which has injured the crop on low lands. *Lauderdale*: Badly damaged by rust.

MISSISSIPPI.—*Grenada*: The rust is general, reducing the promise to half a crop. *Lowndes*: Much injured by rust. Wheat planted in clover-sod is very little affected by rust, and will make twice as much as on similar land without clover. *Neshoba*: Badly damaged by rust. *Choctaw*: Damaged by wet weather. *Kemper*: Now being harvested; generally injured by rust. From 1 bushel of the Tappahannock wheat, from the Department, sowed in 1874, I supplied a few neighbors 25 bushels of seed, and seeded 12 acres; I, and all to whom I sold seed, have made very good crops. This is the only kind which has made a good crop in the county.

TEXAS.—*Bosque*: Damaged to some extent by the Hessian fly and red rust; but the area is so increased that the county will make as much as last year. *Llano*: Considerably damaged by the grasshopper, and a small fly or gnat. *Titus*: The outlook discouraging; 25 per cent. above an average sown, but the red rust struck in some weeks ago. The Jennings, from the Department, has no appearance of rust, but the Tappahannock rusted badly for the first time since introduced. *Bowie*: A partial failure, being full of rust. *Gillespie*: Lost by a freeze, 4 degrees below zero, April 12. *Wood*: Injured by rust, at least 29 per cent. *Palo Pinto*: Injured by rust. *Williamson*: Cut short by Hessian fly and rust. *Collin*: Rust on the blade, but not materially damaged. Some damage by the Hessian fly. *Panola*: Injured by late cold and rust. *Upshur*: Rust, since last February, has done some injury. *Bandera*: Materially injured by rust and drought. *Anderson*: A failure; affected by a yellow tinge, since the 1st of February; cause unknown. *Navarro*: Only half crop, but full and plump, and will weigh well. *Red River*: Rust. *Bezar*: Considerably damaged by rain in harvest. *Cooke*: Struck by rust April 15, when it stopped growing; will be half a crop. *Hunt*: Injured by rust. *Tyler*: A kind here called Aconauga, or California wheat, has now made the third crop, with no sign of rust. It is fine this year; will yield 25 bushels per acre on good land.

ARKANSAS.—*Marion*: Generally low and short-bladed. *Woodruff*: Some rust and smut. *Arkansas*: Some complaint of rust, but only on the blade. *Yell*: A little damaged by rust. *Bradley*: Badly injured by rust. *Craighead*: Quite short. *Saint Francis*: All late wheat greatly damaged by rust; not more than half a crop of winter wheat. *Baxter*: Thin, and heading out low; not over half a crop. *Crawford*: Expect enough for home use, which has not happened before last year since the rebellion. *Independence*: Injured by rust. *Izard*: Rust has appeared. *Prairie*: Injured by rust and birds. *Franklin*: Injured by dry weather, in May, and by rust on the blade. *Sebastian*: Increase of 10 per cent. in acreage, and never better. *Fulton*: A poor crop generally; thin, short, and slender stalk, light short head, and threatened with rust. *Howard*: So badly rusted that many farmers are pasturing it. *Benton*: Not good, owing to ravages of chinchies and the Hessian fly.

TENNESSEE.—*Lewis*: Some rust, but only on the blades; prospect better than average for five years. *McNairy*: Badly damaged by rust. *Blount*: Generally promising, but rust on the blade. *Lincoln*: Recently seized by rust. *Loudon*: All damaged more or less, and some nearly ruined by rust. *Mauzy*: Rust, generally confined to the blade, but in some fields it has attacked the stalk. The fly has also done some damage. *Unicoi*: Promises a good yield. *Gibson*: Much complaint of rust; late sowing thin. *Polk*: The yield considerably reduced by winter-killing, rust, and spot. Rust has nearly destroyed the blade, but has not affected the stalk. *Monroe*: Good so far, but badly rusted on the blade. *Rhea*: Better than for fifteen years. *Sullivan*: Very fine prospect for a heavy crop, though rust is appearing on some late-sown fields on low land. *Van Buren*: Drilled from the 1st to the 15th of October, never better; later, or sown broadcast, not so good. *Bedford*: Rust on the blade. *Serier*: The finest prospect we ever had, but the red rust is now appearing on the blade. *De Kalb*: Rust, confined to the blade as yet. *Fultz* is the best, and is improving each year since its introduction. *Granger*: Very fine; only slight indications of rust on the blade. *Greene*: Very promising; some red rust on the blade. *Knox*: A much larger breadth was sown, with more care in the selection of seed, and more pains in the preparation of the ground; and consequently, up to within a few weeks the prospect has been unusually fine; since then, too much rain has covered the blades with rust, and the heads are not filling well. *James*: Never promised better, until May 20; since which I never saw rust come on so fast. *McMinn*: Damaged 10 to 15 per cent. by red rust and spot. *Bradley*: Promises an abundant yield. *Giles*: Never knew so large an acreage, but it is not up to last year's in quality; some rust and scab. *Fayette*: Very poor. *Lauderdale*: Injured by rust, smut, chess, and hailstorm. *Montgomery*: Acreage 67, but condition extra promising.

WEST VIRGINIA.—*Nicholas*: Very fine. *Putnam*: Promising. *Berkley*: Better than for five years. *Mercer*: More promising than last spring. *Greenbrier*: Unusually fine. *Netzel*: Badly winter-killed on thin and wet land; where not, coming on finely. *Brax-*

ton: Promises above average. *Gilmer*: Some injured by frost, April 30th. *Upslar*: Looking fine. *Cabell*: Very much injured by freeze, May 1st, and since by drought. *Summers*: Very promising.

KENTUCKY.—*Bath*: Badly injured by the freezes in March and April. *Warren*: An early harvest and a fine crop. *Anderson*: Materially injured by drought. *Pendleton*: Suffering from drought. *Shelby*: The fields exceedingly spotted; cannot be over 75 per cent. of a crop. *Callaway*: A good yield is expected. *Hardin*: Thin, with short heads. *Casley*: Injured by the freeze in March. *Simpson*: Not more than half it promised six weeks ago. *Bracken*: The Clawson wheat is a perfect success. *Russell*: The area increased 20 per cent., and 20 per cent. better stand; rust is making its appearance. *Spencer*: Very short straw and putting out small heads; drought. *Ballard*: Badly winter-killed, and damaged by rust, smut, and scab. *Gallatin*: Injured by drought. *Jessamine*: One-third of the crop badly winter-killed. *Nicholas*: Thin, low, and short heads, owing to drought. *Todd*: Rust on the blade. *Carroll*: Reduced by drought. *Livingston*: Looks well.

OHIO.—*Miami*: About 25 per cent. was frozen out; that standing was never better. *Trumbull*: The prospect very poor. *Williams*: Badly frozen out; that left looks very well. *Adams*: Some fields look well, but many have been going back, owing to the fly and bug. *Tuscarawas*: Coming out much better than the spring indicated. *Finney*: Never looked better the first of March, but, owing to cold and wet, many fields will not pay for cutting. *Crawford*: Almost a failure; frozen out. *Delaware*: Cannot be more than half a crop. *Pickaway*: Almost a failure; thousands of acres are being plowed up for corn. *Ross*: Fair prospect, though the freeze in March killed a great deal. *Huron*: Not over 25 per cent. of a crop. *Wood*: Badly frozen out. *Cauga*: Many pieces entirely winter-killed. *Lucas*: Badly killed on clay and undrained soils; upon leamy soils and tile, drained land, promises well. *Sandusky*: Winter-killed. *Seneca*: The poorest for ten years.

MICHIGAN.—*Muskegon*: Badly winter-killed on heavy lands; on light, above average. *Oakland*: The best for five years. *Kalamazoo*: Looks exceedingly well. *Calhoun*: Stands well. *Lake*: The Clawson wheat a decided success; the yield large, and the straw long and stout. *Ottawa*: Badly frozen, but doing first-rate now. *Shiawassee*: Coming forward very rapidly. *Fan Buren*: Somewhat spotted from winter-killing. *Wayne*: Nearly ruined by winter-killing, and much of it plowed up. *Mason*: Looks very fine. *Saint Joseph*: Shorter at heading than common.

INDIANA.—*Kosciusko*: On prairie and hilly land, never looked better; on low clay land, very poor. *Noble*: Injured in the winter; some fields not worth cutting. *Pulaski*: All but ruined in the winter; many fields plowed up. *Washington*: On ground well prepared and dressed, fine; on poor ground, very light, not more than 50 per cent. of the usual acreage sown. *Franklin*: Badly frozen out. *Howard*: Depreciated 50 per cent. in the winter. *Dearborn*: Almost entirely winter-killed. *Hamilton*: A very short crop sown, and much of that not worth cutting; winter-killed. *Huntington*: A poor yield; winter-killed; much plowed up. *Johnson*: Nearly half sown in the fall plowed up; that left will not average over 7 bushels per acre. *Wabash*: Suffered in the winter; much plowed up. *Warrick*: Suffered from the extremely dry spring. *Carroll*: A portion of the land soon plowed up. *Dubois*: Injured by drought in May; heads very short. *Gibson*: Heading very low, and thin on the ground. *Switzerland*: Winter-killed; 35 per cent. below average. *Madison*: Half crop.

ILLINOIS.—*Bureau*: Considerable destroyed by freezes. *Gallatin*: Looks well. *Clin-ton*: Badly winter-killed. *Effingham*: Not more than 25 per cent. of a crop, owing to the March freeze. *Fayette*: Not more than half a crop. *Jersey*: Appearances indicate a large crop. *Madison*: Good heads, but thin and mixed with chaff. *Mason*: Looks well. *Jefferson*: Full heads, but rather thin. *Montgomery*: Much better than expected in many localities; in others, plowed up. *Perry*: Badly winter-killed. *Williamson*: Injured by the hard freeze in March. *McLean*: Never better.

WISCONSIN.—*Barron*: Looks well. *Pierce*: Nearly all killed. *Waupaca*: Badly winter-killed. *Walworth*: Seriously injured by freezing. *Iowa*: Has improved the last three weeks very much.

MINNESOTA.—*Isanti*: The Arbutha wheat from the Department is well suited to this climate. It is spread all over the county, and is eagerly sought for. *Sherburne*: A total failure.

MISSOURI.—*Douglas*: Owing to the dry weather last fall, less than half the usual quantity was sown. That came up indifferently, and the Hessian fly has destroyed full half of it. *Jasper*: Never more promising. *Laclede*: Small acreage, but promises well. *Montgomery*: Suffering for rain. *Platte*: Never better prospect for an abundant crop. *Stone*: Materially damaged by the fly, and the rust has appeared. *McDonald*: Injured by rust. *Vernon*: Prospect of a heavy crop. *Christian*: Very indifferent. *Lincoln*: Ripening early. *Perry*: Scarcely half of last year's crop. *Pettis*: Splendid. *Saint Francis*: Only half the amount intended put in in the fall, owing to continued dry weather. These who did sow have a fine prospect. Some who sowed in January have as fine prospect as those who sowed in the fall. *Shelby*: The little sown looks

well. *Boone*: About 25 per cent. of an average crop growing, and that looks first rate, but chinch-bugs are in it. *Marion*: Not over 50 per cent. average acreage; good on all dry land. *Chariton*: Prospect of a good yield. *Johnson*: Very heavy straw; inclined to rust. *Mississippi*: Very promising till within 10 days: the rust has killed the blade, but not yet touched the stem. *Barton*: Never better. *Jefferson*: Does not look well. *Phelps*: Damaged by the Hessian fly. *Dallas*: Injured by the fly. *Reynolds*: At least 67 per cent. rusted very badly. *Wright*: Injured by the fly; not over 25 per cent. of a crop.

KANSAS.—*Reno*: Late sown, badly injured by rust. *Barbour*: Small acreage; looks promising. *Doniphan*: Extraordinary promise. *Butler*: Good beyond precedent. *Cherokee*: Prospect never better. *Douglas*: Some appearances of rust. *Ellis*: Owing to drought, did not come up till spring; looking well. *Jackson*: Prospect of the largest crop ever grown. *Labette*: Scarcely ever more promising, though there is much rust on the blade. *Lyon*: Rusting. *Montgomery*: Promises a very large yield; 40,000 acres sown last fall. *Wyandotte*: Looking fine. *Chase*: Reduced by late sowing, heavy rains, hail-storms, rust, and joint-worms; but improving greatly the past week. *Shawnee*: A fine promise reduced by rust to half a crop. *Cherokee*: The finest prospect ever known.

CALIFORNIA.—*Contra Costa*: Early sown, excellent; late, suffering from dry weather. *San Joaquin*: The prospect very flattering, except on the heavy black land near Stockton. *Sutter*: Never looked better. *Butte*: All that could be desired. *Placer*: The promise of the crop is superior to any for a number of years.

OREGON.—*Clackamas*: Never better. *Columbia*: Looks splendid, but not over half as much as last year.

UTAH.—*San Pete*: Looks first rate.

DAKOTA.—*Buffalo*: Suffering from dry weather.

SPRING WHEAT.

Acreage.—The States reporting a decrease of acreage, compared with the previous crop, are Vermont, 6 per cent.; New York, 13; Kentucky, 15; Illinois, 12; Wisconsin, 5; Iowa, 11; Kansas, 4; and Oregon, 3. The States reporting an increase are Pennsylvania and Nebraska, 4 per cent.; Texas (which reported an increase of 21 per cent. last year) and Ohio, 16; Arkansas, 7; Michigan, 5; Indiana and Minnesota, 10; Missouri, 12; and California, 6. In the latter State, there being no distinct dividing-line between winter and spring wheat, the variations in acreage are affected by a somewhat capricious classification. The returns indicate about the same acreage as last year.

Condition.—Among the Eastern and Middle States the condition is lowest in New York, being 94; it is 100 in Maine, Connecticut, and Pennsylvania. In the Northwest, while it is 1 per cent. above in Wisconsin and Minnesota, it falls 3 per cent. below in Iowa. The reduction is ascribed mainly to drought, though ravages of grasshoppers are specified in one county. Missouri falls 8 per cent. below; Kansas rises to 98, and Nebraska to 100.

MAINE.—*Piscataquis*: Increased acreage. *York*: Has come up finely. *Androscoggin*: Barely up. *Oxford*: Fair, though late.

NEW HAMPSHIRE.—*Rockingham*: Doing well.

NEW YORK.—*Albany*: Very backward.

GEORGIA.—*Rabun*: Very promising. *Hart*: Increased acreage and good crop, though affected with rust in localities.

TEXAS.—*Burleson*: Much injured by drought. *Gillespie*: Badly injured by drought and grasshoppers. *Williamson*: Cut short by Hessian fly and rust.

TENNESSEE.—*Monroe*: Badly rusted on the blade—red rust.

OHIO.—*Delaware*: Increased acreage and fine prospect. *Wood*: Increased acreage, promising a good yield. *Geauga*: Increased acreage, coming forward with rapidity.

MICHIGAN.—*Oakland*: The best for five years. *Mason*: Looks very fine.

ILLINOIS.—*Mason*: Looks well. *Ogle*: Less acreage, but promising. *Mercer*: Quite thin. *McLean*: Thin.

WISCONSIN.—*Sheboygan*: Backward.

MINNESOTA.—*Chippewa*: If no calamity occurs, the crop in Western Minnesota will be enormous. *Fillmore*: The dry and hot weather, for the last ten days, has given the crop a bad look.

IOWA.—*Shelby*: Suffering for want of rain, and from young grasshoppers in some

localities. *Hardin*: Late sown, but favorable weather is bringing it forward rapidly. *Cherokee*: Looking well. *Howard*: Early sown, very promising. *Madison*: Not doing well, owing to extreme dry weather following wet. *Tama*: Very thin.

KANSAS.—*Doniphan*: Sown too late, and injured by heavy rains.

OREGON.—*Clackamas*: Much more sown than usual, but, owing to continual late rains, does not look well.

UTAH.—*Kane*: Injured by cold winds and a heavy frost. *San Pete*: Much injured by late frosts.

DAKOTA.—*Devils*: Looking well.

WASHINGTON.—*Thurston*: Coming on very finely. *Whitman*: A large increase in acreage.

COTTON.

The June returns indicate a slight reduction of area in cotton, comparatively late planting, good stands except in cases of too early planting or inundation, growth not up to the average for the season, healthy and improving condition, and clean culture, with the exceptions caused by heavy rains that stimulate growth and prevent working. The largest local reduction in area has been in Louisiana, caused by the overflow and wet weather in the planting season. The next largest is in Tennessee, where the season has been cold and wet. In certain districts in Texas there has been an effort to substitute corn for cotton, but in one-fourth of the counties there has been a positive increase, and in nearly half the remainder no decrease, while the enlargement of the total area of arable crops is rapidly increasing. The figures for acreage are as follows: North Carolina, 98; South Carolina, 99; Georgia, 94; Florida, 89; Alabama, 100; Mississippi, 98; Louisiana, 89; Texas, 100; Arkansas, 100; Tennessee, 95. The reduction in the entire area is about three per cent. In Virginia and North Carolina there is some complaint of bad stands and small growth from cold nights, though the plants are healthy, and the culture generally clean. The late planting promises well in South Carolina. Early seeding has been productive of poor stands. The condition averages very high in Georgia, owing to seasonable rains, fine weather for work, and abundant labor. Drought at the time of planting has affected the crop unfavorably in Florida. Stands are generally good in Mississippi and Alabama, and the plants healthy though small. In Louisiana overflows have seriously injured the crop in exposed locations. Droughts in some parts of Texas have been injurious. The plant is looking well in Arkansas and Tennessee, except in places where it was injured by incessant rains or inundations.

The condition of the several States is as follows: North Carolina, 101; South Carolina, 98; Georgia, 103; Florida, 82; Alabama, 94; Mississippi, 92; Louisiana, 89; Texas, 90; Arkansas, 95, and Tennessee, 93.

The average condition of the cotton-crop on the first day of June of the present year, and six years next preceding, is shown in the following table:

States.	1876.	1875.	1874.	1873.	1872.	1871.	1870.
North Carolina	101	92	89	85	96	90	94
South Carolina	98	97	81	88	92	92	96
Georgia	103	91	80	94	94	82	101
Florida	82	94	90	98	95	103	95
Alabama	94	101	82	93	105	83	102
Mississippi	92	100	78	92	100	84	95
Louisiana	89	95	70	94	104	90	101
Texas	90	96	98	86	100	93	97
Arkansas	95	90	75	92	98	83	101
Tennessee	93	99	90	90	99	90	85

An analysis of these figures shows that the condition of the crop is nearly but not quite so favorable as on the 1st day of June, 1875; the June average of 1876 is also less than in 1872 and 1870, but greater than in 1874, 1873, and 1871. The opening prospect for the growing crop is, then, at least a full average with late years, but its character and productiveness depend upon the subsequent developments of the season and the culture bestowed upon it.

The following notes from our statistical correspondence will illustrate the local aspects of the crop in different parts of the cotton area :

NORTH CAROLINA.—*Laurens*: Suffering from cold nights. *Union*: Plant small; stand very good. *Edgefield*: Good stand, healthy-looking. *Orange*: Prospect good. *Pamlico*: Looking remarkably well. *Alamance*: Came up well, good stand. *Duplin*: Diminished acreage; stand unusually good; growing finely. *Edgecombe*: Late planting is not up yet; early planting, fine. *Pitt*: Stand good, free from grass. *Wilson*: Some complaint of cotton dying. *Cumberland*: Fifteen days behind average season; rather inferior stand. *Columbus*: Owing to cool nights, stand is bad. *Beaufort*: Plant small, but stand good and healthy. *Gaston*: Acreage same as last year; good stand.

SOUTH CAROLINA.—*Fairfield*: Looks well, and has a very good stand. *Williamsburgh*: Very promising. *Orangeburgh*: Looks well, but is backward. *Marlborough*: Condition fine; stand perfect; slight injury from lice. *Lexington*: Somewhat backward. *Chester*: First planting, bad stand and unhealthy; later planting, good stand, healthy, and promising. *Newberry*: Stand generally good. *Clarendon*: Increased acreage; very promising. *Georgetown*: Good stand; plant small, but promising.

GEORGIA.—*Worth*: Plant is small, but looks well. *Richmond*: Good stand; seldom such regularity. *Schley*: In good condition. *Gordon*: Inferior stand and feeble weed. *Wilcox*: Plant small. *Terrell*: In good condition. *Batts*: Stand good; plant never looked better. *Troup*: Excellent. *Laurens*: Never better. *Hart*: Better than for many years. *Dodge*: Good prospect. *Cobb*: Fine. *Walton*: Stand good; season favorable. *Stewart*: Average stand; complaint of grass. *Montgomery*: Good stand; free from rust. *McIntosh*: Plant small, but healthy. *Lincoln*: Good stand, but rather backward. *De Kalb*: Stand good; backward, but average prospect. *Carroll*: In fine condition. *Clayton*: Very fine.

FLORIDA.—*Columbia*: Looking well, but bad stand. *Gadsden*: Bad weather and cut-worms have caused a defective stand. *Melison*: Late, on account of backward spring. *Jackson*: Stand good; plant late.

ALABAMA.—*Greene*: Stand above average. *Dale*: Best stand ever known, and looks very healthy. *Russell*: Stand remarkably good. *Hale*: Stand not very good; grassy, owing to excessive rains. Crop two weeks late. *Lee*: Heavy rains have caused rank growth of grass. *Jefferson*: Too much rain and grass. *Franklin*: Acreage very great; condition satisfactory. *De Kalb*: Came up well, but has suffered from bad weather and insect injuries. *Colbert*: Growing well. *Autauga*: Looking well. *Dallas*: Increased acreage; condition not so good, owing to imperfect stands. *Concehuc*: Stand never better; increased acreage. *Calhoun*: Doing well; excellent stand. *Lauderdale*: Plant remarkably small; stand inferior. *Monroe*: Unusually late. *Macon*: Cottonlands too wet this season. *Blount*: Diminished acreage; later than usual. *Morgan*: Some complaint of imperfect stand. *Perry*: Increased acreage; prospect good. *Randolph*: Generally clean, but small.

MISSISSIPPI.—*Greenville*: The overflow has materially injured the cotton-crop in part of the county. *Choctaw*: Not more than 75 per cent. of last year's acreage; on account of damaged seed, a great many have plowed up and planted corn. *Jefferson*: A good stand, but grassy. *Perry*: Mostly planted late; appearance fair. *Codomo*: An inclination to procure improved cotton-seed. *Covington*: Not doing well. *Clark*: A very bad stand of cotton, and an excessive stand of grass. *De Soto*: Late, but a good stand, and in good condition. *Lincoln*: The stand defective on account of cold and wet. *Neshoba*: In some instances the stand is bad, and the crop late, and looking unhealthy. *Rankin*: Much complaint of poor stand; late and sickly. *Grenada*: Did not start well; but the stand is generally good, and the weather now favorable. *Pike*: Looks well, although backward, on account of rains and cold weather.

LOUISIANA.—*Carroll*: The plant is finer than for years; the stand is perfect, but generally grassy. *Jackson*: Backward, but improving. *Concordia*: Decrease of 30 per cent. in acreage on account of the overflow; under the most favorable circumstances, 35 per cent. of the area planted will not average one-third of a crop. *East Baton Rouge*: Had to be plowed up and planted over on account of the extreme cold on the 19th and 20th of March. *Rapides*: About 15 days behind last year; good stand generally. *Franklin*: Late and very small; large percentage under water. *Richland*: Four or five weeks later than usual; the stand not good, owing to heavy rains and cold nights.

TEXAS.—*Washington*: Increased acreage; looking very well. *San Jacinto*: Prospect

good. *Texas*: Increased acreage, but not more than a two-thirds crop planted. *Robertson*: Ten per cent. not up. *Barleson*: Stand not good; many fields have altogether failed to come up. *Collins*: Very good. *Panola*: Fine stand; rather late. *Polk*: Late, owing to late, wet spring. *Lawson*: Vigorous growth; good stand. *Waller*: Crop this year better than last. *Navarro*: Stand good. *Nacogdoches*: Good stand; looking fine. *Matagorda*: Stand scattering; 50 per cent. not up yet. *Fort Bend*: About half stand, and this dying from want of moisture. *Cherokee*: The teachings of the Grange have been carried out in the reduction of cotton and increase of cereals. *Austin*: Less cotton, more corn planted. *Fayette*: Drought has injured the crop. *Bandera*: Little planted, and that little has not sprouted; cause, drought. *Bell*: Good stand. *Colorado*: Good, but late; acreage 15 to 20 per cent. above last year. *Gonzales*: Doing well. *Hays*: Prospect good. *Kendall*: Prospect for heavy yield. *Williamson*: Late; one-half just coming up.

ARKANSAS.—*Franklin*: Small for the time of the year. *Scott*: Prospect very flattering. *Fulton*: Stand generally good, clean, and well worked. *Crawford*: Late, but looks well. *Dallas*: The weather has been favorable for cleaning, and the stand is very good. *Leard*: Stand is very good. *Ouachita*: About two weeks late: the stand is good, and the plants look well, but very grassy. *Woodruff*: Scarcity of labor and low prices have caused a reduction of 10 per cent. in acreage. *Bradley*: Good stand, and looks healthy. *Craighead*: Stand and condition generally good, but backward.

TENNESSEE.—*Lauderdale*: The outlook for the crop is 25 per cent. better than last year, and more planted. *Rutherford*: Very promising; the stand good and growing finely. *Gibson*: Late planted, but the stand excellent.

OATS.

Acreage.—The entire acreage is slightly increased over that of last year. States indicating the largest absolute increase are Wisconsin, and California, 102; Minnesota, 109; Iowa, 101; Nebraska, 103. A very large relative increase is reported in the Southern States: in Texas, 57 per cent.; Georgia, 30; South Carolina, 12; Louisiana, 7. A decrease of 3 per cent. is indicated in New York, 4 in Illinois and Tennessee, 2 in Kentucky, Indiana, and Missouri, 1 in Iowa, Kansas, New Hampshire, Vermont, and Connecticut.

Condition.—In New England the range is from 100 to 110. In the Middle States, Pennsylvania is average; New York, 3 per cent. and New Jersey 1 per cent. below. Michigan is 100. The States west of the Mississippi range from 100 to 103, except Arkansas, 89; Missouri, 99, and Oregon, 92. In West Virginia and the Ohio Valley the general condition is about average, except in Kentucky, where an extensive drought has reduced it 15 per cent. below. On the South Atlantic coast, Delaware and Maryland report 8 per cent. below; Virginia, 7; and North Carolina, 5. In the two latter States late spring frosts and subsequent dry weather are assigned as the principal causes. South Carolina is 12 and Georgia 10 per cent. above. In these States both winter and spring oats, with few local exceptions, appear to have matured in good condition. Rust, almost universal on the wheat, affected this crop but slightly. It did more injury in Alabama, reducing the condition 2 per cent. below. In Texas the largely increased acreage is very nearly average in condition. The harvest was going on at the time of reporting, and the indicated average yield was fully 40 bushels per acre.

MAINE.—*Waldo*: Early-sown are looking fine. *York*: Have come up finely.

CONNECTICUT.—*New London*: Very good.

NEW YORK.—*Albany*: Very backward. *Genesee*: Doing finely.

NEW JERSEY.—*Warren*: Look extremely well.

PENNSYLVANIA.—*Perry*: Short, owing to the cold spring, but enough on the ground. *Beaver*: A dry and cold April hurt the oats badly. *Bucks*: Very promising. *Lycoming*: Promising. *McKean*: Very late. *York*: Indications of a more than average crop. *Washington*: Have made a very fine start. *Northampton*: Look well, and are growing finely.

DELAWARE.—*Kent*: Injured by the cold spring.

MARYLAND.—*Baltimore*: Recruited much by the late rains. *Howard*: Will be light.

VIRGINIA.—*Fluvanna*: Very bad on high grounds; doing well on low; spring oats a failure. *New Kent*: Spring oats look bad; winter, very good. *Orange*: Very backward, and the prevailing dry weather exceedingly unfavorable to the crop. *Page*: Unpromising. *Halifax*: Early-sown spring oats badly killed by frost. *Charlotte*: Those not killed by late frosts look remarkably well. *King George*: Low, but time yet for a good growth. *Prince William*: Stands thin. *Pulaski*: Backward. *Madison*: Promising. *Middlesex*: Never better. *Floyd*: Very promising. *Augusta*: Short and backward. *Dinwiddie*: Spring oats did not come up well, and are looking badly. The winter oat is becoming very popular. Seeded in September or the first of October, it is almost a sure crop, and the yield much larger than of spring oats. The crop seeded last fall is looking very fine. *James City*: Fall oats are No. 1; spring, all killed. *Prince George*: The poorest crop for years. The Schonen oats by far the best. *Northampton*: The crop seriously damaged by cold dry weather. The fly also made its appearance in the latter part of May, and so damaged the crop that many fields will not be harvested. *King and Queen*: Very backward, and looking decidedly poor.

NORTH CAROLINA.—*Beaufort*: Will be short, owing to dry weather the last three weeks. *Caswell*: Spring oats injured by frosts; will not yield half a crop; winter oats more promising. *Nash*: Suffering for want of rain. *Person*: Spring oats killed by a late freeze; winter oats, about half the crop looking fine. *Haywood*: Looking very fine. *Pamlico*: Injured by drought.

SOUTH CAROLINA.—*Edgefield*: Injured by drought. *Clarendon*: A largely increased acreage now ready for the sickle. *Richland*: Large and very fine crop. *Lawrence*: Better than usual, especially the red-rust-proof.

GEORGIA.—*White*: The poorest ever seen. *Dooly*: The finest crop ever known. *Wayne*: Very inferior, owing to drought in winter and spring. Most of the crop is housed. *Gwinnett*: Unusually fine, both fall and spring oats. *Randolph*: Look fine, but there is much smut. *Worth*: Finer than known in twenty years. *McDuffie*: Will make nearly double made in any year since the war. The fall oats are all ready to cut, and no sign of rust on the spring oats. *Wilcox*: Injured by dry weather, but the acreage 30 per cent. larger than last year. *Bulls*: Never better. *Madison*: Many farmers have changed the sowing of oats from spring to fall, which accounts for the fact that the figures for both acreage and condition are 150. *Lawrens*: Very good. *Spalding*: All agree that such a prospect was never before known. *Troup*: Fall oats never better; sown early in the spring, very good; late, a total failure from rust. *Cobb*: Both winter and spring oats very promising. *Lincoln*: Fine. *Walton*: Unusually promising, and the season favorable. *Carroll*: Never better, both fall and spring. *Jefferson*: Rather dry for oats, but more than in any year since the war.

FLORIDA.—*Madison*: Those properly put in and manured, fine; the remainder injured by drought. *Gadsden*: Very superior.

ALABAMA.—*Dale*: Half the crop ruined by rust; the other half very good. *Greene*: Look fine. *Blount*: Fall oats, fine; spring oats rather backward. *Creenshaw*: Rusted in some localities. *Perry*: The best crop in ten years. *Randolph*: Look fine. *Calhoun*: Very fine; now being harvested. *Concuh*: Ripening fast, and harvesting going on. *De Kalb*: Looking well. *Butler*: Seriously injured by rust. *Barbour*: Spring oats almost invariably rusted; considerable rust on oats heretofore considered rust-proof.

MISSISSIPPI.—*Amite*: The crop is made, and is very good. The red oat is being generally cultivated. *Perry*: Blighted by rust; not over half a crop. *Corington*: Late oats nearly ruined by rust. *Choctaw*: Three-fourths of a crop.

LOUISIANA.—*Claiborne*: Being injured by rains and rust. Red-rust-proof oats are doing well.

TEXAS.—*Burleson*: Spring oats much injured by drought. *Gonzales*: The largest acreage ever sown, and yields forty bushels per acre; about harvested. *Williamson*: Very good, will average forty-five bushels per acre. *Upshur*: Better than last year. The Holstein oats from the Department are superior to any other in this vicinity. *Red River*: Very good. *Bexar*: Considerably damaged by rain in harvest. *Cooke*: Very fine. *Victoria*: Harvested; average forty bushels per acre. *Tyler*: The red-rust-proof are fine; will yield thirty to fifty bushels per acre.

ARKANSAS.—*Bradley*: Badly injured by rust. *Independence*: Much improved by recent rains. *Arkansas*: Backward, but good. *Marion*: So short that they will have to come out considerably before they can be cut. *Franklin*: Injured by dry weather in May. *Cross*: Have suffered from dry weather. *Scott*: Prospect very flattering. *Howard*: Almost ruined by rust.

TENNESSEE.—*Lewis*: Prospect very flattering. *Williamson*: Less sown every year; seriously damaged by dry weather in April. *Blount*: Damaged by late frosts. *Unicoi*: Frozen out badly in March. *Monroe*: Both winter and spring oats were never better. *Rhea*: Better than for fifteen years. *Sullivan*: Killed out badly by the late freeze. The winter-oat is gaining favor every year. *Serier*: Never so good. *Grain-ger*: Some were killed by the freeze, but in the main they look well. *Greene*: Fall sown, splendid; spring sown, not promising. *James*: An increase of 20 per cent. in acreage, and never looked better. *Bradley*: Very fine. *Payette*: Very good.

WEST VIRGINIA.—*Marion*: Doing well. *Nicholas*: Look well. *Mercer*: Late. *Cabell*: Have suffered much by drought. *Doddridge*: Somewhat injured by drought. *Summers*: Promising. *Randolph*: Badly injured by frost May 1, but recuperating.

KENTUCKY.—*Anderson*: Materially injured by drought. *Oldham*: Have suffered for want of rain. *Pendleton*: Will amount to but little, owing to drought. *Owsley*: Badly injured by the freeze in March. *Spencer*: Not over 50 per cent. of a crop, owing to drought. *Gallatin*: Badly injured by drought. *Nicholas*: Will be almost a failure, owing to drought. *Henry*: Almost ruined for want of rains. *Carroll*: Reduced by drought. *Owen*: Lessened 10 per cent. by drought.

OHIO.—*Preble*: Have made a very rapid growth. *Williams*: Look well. *Morrow*: Late in starting, but look promising. *Crawford*: Prospect good. *Delaware*: Large acreage and good stand. *Portage*: Very fine. *Wood*: The best ever seen, but acreage decreased. *Meigs*: Fine.

MICHIGAN.—*Shiawassee*: Backward, but promising. *Van Buren*: The season favorable for oats. *Mason*: Look very fine. *Saint Joseph*: Have a very fine start.

INDIANA.—*Kosciusko*: Never better. *Noble*: Never much better. *Franklin*: Short and unthrifty. *Howard*: Look well. *Crawford*: Suffering for want of rain. *Dearborn*: A severe drought through the whole month of May has seriously damaged the crop. *Warrick*: Suffered much from the dry spring. *Switzerland*: Good.

ILLINOIS.—*Macoupin*: Will be short. *Woodford*: Indications of a fine crop. *Gallatin*: Look well. *Clinton*: Too much rain for oats. *Fayette*: Look well, but small acreage. *Ogle*: Favorable appearance. *Jefferson*: Splendid. *Mercer*: Quite thin.

WISCONSIN.—*Sheboygan*: Backward.

MINNESOTA.—*Fillmore*: Suffering from dry and hot weather for the last ten days.

IOWA.—*Marion*: Coming forward finely. *Howard*: Early sown very promising. *Madison*: Not doing well, owing to extreme dry weather, following wet.

MISSOURI.—*Montgomery*: Suffering for rain. *Platte*: The season too wet for oats. *Pettis*: Very flattering. *Saint Francis*: Fine. *Maries*: Have suffered on wet land. *Oberton*: Very fine. *Reynolds*: Very fine.

KANSAS.—*Cowley*: Increased acreage; looking well. *Reno*: Splendid. *Barbour*: Late, but doing well. *Cherokee*: Few sown, but look fine. *Lyon*: Rusting. *Cherokee*: Acreage decreased 50 per cent. from cold, wet, backward spring.

NEBRASKA.—*Furnas*: The reduced condition (90) occasioned by damaged seed.

CALIFORNIA.—*Butte*: All that could be desired.

DAKOTA.—*Darison*: Look well. *Buffalo*: Suffering from dry weather.

RYE.

The condition of winter-rye corresponds very nearly with that of winter-wheat, except that it suffered less from winter-killing. The returns for condition from States producing 250,000 bushels or more, average, Connecticut, 96; New York, 87; New Jersey, 91; Pennsylvania, 92; Maryland and Virginia, 102; North Carolina, 101; West Virginia, 103; Kentucky, 95; Ohio, 76; Indiana, 86; Illinois, 91; Wisconsin, 93; Iowa, 74; Missouri, 95.

MAINE.—*Androscoggin*: Looking well.

NEW YORK.—*Albany*: Very spotted; rye sown with a drill and receiving proper treatment otherwise, looks well. *Schoharie*: Badly winter-killed; not half a crop. *Orange*: Injured by winter-killing.

NEW JERSEY.—*Warren*: Thinish on the ground; but looks well.

PENNSYLVANIA.—*Northampton*: Looks better than last year.

MARYLAND.—*Caroline*: Does not look as well as usual. *Baltimore*: Has a fine appearance. *Howard*: Badly winter-killed. *Dorchester*: Looks remarkably well.

VIRGINIA.—*Patrick*: Not so good as wheat, but 120. *Dimeidie*: Very luxuriant.

GEORGIA.—*Rabun*: Never better.

TEXAS.—*Titus*: Will be reduced by rust to half a crop.

ARKANSAS.—*Arkansas*: Very tall and good all over the county. *Franklin*: Injured by dry weather in May.

TENNESSEE.—*Williamson*: More sown than last year, and looks well. *McNairy*: Badly damaged by rust. *Unicoi*: Promises a good yield. *Rhea*: Better than for fifteen years.

WEST VIRGINIA.—*Nicholas*: Looks well. *Mercer*: More promising than last spring.

KENTUCKY.—*Pendleton*: Suffering from drought. *Spencer*: Very short straw and putting out small heads; drought. *Gallatin*: Injured by drought.

OHIO.—*Tinton*: Never looked better. *Crawford*: almost a failure; frozen out.

INDIANA.—*Howard*: Depreciated 50 per cent. in the winter. *Switzerland*: Winter-killed; 35 per cent. below average.

ILLINOIS.—*Baran*: Injured by the freezes. *Ogle*: Promising.
 WISCONSIN.—*Baron*: Looks well. *Waupaca*: Badly winter-killed. *Walworth*: Seriously injured by freezing.
 IOWA.—*Cherokee*: Killed in the winter so as to make it thin.
 MISSOURI.—*Platte*: Looking well. *Vernon*: Some early-sown winter-rye has been found covered with chinch-bugs, and plowed under; but there is less complaint from this cause than for many years. *Chariton*: Prospect of a good yield.
 KANSAS.—*Jackson*: Prospect of the largest crop ever grown. *Labette*: Looks fine, with plenty of straw. *Shawnee*: Looks splendid.
 CALIFORNIA.—*San Joaquin*: For the first time in many years considerable attention has been paid to raising rye, and the prospect is good.

BARLEY.

Acreage.—The entire acreage of spring-barley has been increased nearly 3 per cent. over that of last year. The States reporting a decrease are Tennessee, 2 per cent.; Kentucky, 8; Ohio, Indiana, and Iowa, 5; Illinois, 3. The States returning the largest absolute increase are New York, 4 per cent.; Michigan, 6; Wisconsin, 9; Minnesota and Kansas, 17; Missouri, 6; California, 7. Texas, which in 1875 increased its acreage 5 per cent. over the previous year, has advanced that 13 per cent. An increase of 7 per cent. is reported in Vermont and of 12 in Massachusetts.

Condition.—The general condition of spring-barley in New England is good. It is average in Michigan, 1 per cent. above in Minnesota, and 7 per cent. above in California. In the other States in which barley is an important crop it falls below: New York and Iowa, 4 per cent.; Pennsylvania, 2; Kentucky, owing to drought and late freezes, 19; Indiana, 12; Illinois, 3; Wisconsin, 1.

Winter-barley.—Except in Missouri, 92, the condition of winter-barley is above average in all the States producing it west of the Mississippi: Arkansas, 11 per cent.; Kansas, 3; Nebraska, 25; California, 4. Georgia reports 11 per cent. above, Texas 1 per cent. below.

NEW YORK.—*Albany*: Very backward. *Genesee*: Came up well and is doing finely.
 TEXAS.—*Colin*: Harvested; some crops thrashed over 100 bushels per acre. *Cooke*: Winter-barley very fine.

TENNESSEE.—*Rhea*: Better than for fifteen years.
 KENTUCKY.—*Jasmine*: A third of the crop badly winter-killed.
 OHIO.—*Preble*: Has made a very rapid growth.
 INDIANA.—*Franklin*: Badly frozen out. *Switzerland*: Almost a failure; winter-killed.
 DEARBORN: A severe drought through May seriously damaged the crop.

ILLINOIS.—*Ogle*: Fair prospect.
 WISCONSIN.—*Sheboygan*: Backward.
 MINNESOTA.—*Fillmore*: The dry and hot weather for the last ten days has given the crop a bad look.

IOWA.—*Marion*: Late grown but coming forward finely. *Howard*: Mostly sown late, which was a great mistake, as the drought and heat have thinned the crop.

MISSOURI.—*Chariton*: Very fine.
 KANSAS.—*Labette*: Growing off rapidly.
 CALIFORNIA.—*Contra Costa*: Early sown, excellent; late, suffering from dry weather. *Santa Clara*: Early-sown looks well; late will not yield more than half a crop. *San Joaquin*: The prospect very flattering, except on the heavy black land near Stockton. *Stanislaus*: Has filled better than wheat. *Sutter*: Never looked better. *Butte*: All that could be desired. *Placer*: Better than for years.
 NEW MEXICO.—*Mora*: Doing well.

CLOVER.

Acreage.—In the Eastern and Middle States, taken as a whole, the area of clover remains about stationary; New York and Pennsylvania indicate no change, and the slight variations of decrease and increase in the other States about counterbalance one another. In Maryland, a

decrease of 1 per cent. is ascribed to a scarcity of seed; in Wisconsin, 12 per cent. to winter-killing. The area is diminished 1 per cent. in Minnesota, and remains unchanged in Indiana. All the remaining States indicate an increase varying from 1 to 28 per cent. The rate last named is reported from Nebraska. Other States returning a high rate of increase are Mississippi and Kentucky, 23 per cent.; California, mainly, if not exclusively, in alfalfa, 20; Kansas, 13; Texas, 9; Tennessee, 8; Delaware and Alabama, 7; Michigan, 6; Arkansas, Missouri, and Ohio, 5; Virginia and North Carolina, 4.

Condition.—Among the States north of the Potomac and east of the Ohio, Maine reports an average condition of 102; Massachusetts, 104; Rhode Island and Delaware, 105; the remainder range from 99 in Pennsylvania to 88 in New Jersey. The reduction in the latter was caused mainly by last year's drought. New York is 4 per cent. below. The drought in Kentucky has reduced the condition to 98. Wisconsin is 93, and Minnesota 95. The condition is average in Indiana and Oregon, and above in all the remaining States. The highest is in Tennessee, 112; West Virginia, 109; Missouri, 107; Texas, 106; Nebraska, 104.

PASTURES.

The favorable condition of spring-pastures, throughout the entire country, has rarely been equaled, and was probably never excelled. Returns from Vermont make the average 96; but as the reduction is owing mainly to backwardness, resulting from the very late spring, it signifies a good condition in reserve rather than a positively defective one. Owing to the effects of a severe drought last season it falls 1 per cent. below in New Jersey; and, owing to a drought prevailing in May, it is 3 per cent. below in Kentucky. Florida and Louisiana also report an average of 3 per cent. below, the reduction being confined to a few counties, while a large majority are 100 or above. In all the other States, in all sections, the condition ranges from 100 upward. Ohio rises to 119; Tennessee and West Virginia, 111; Massachusetts and California, 110; Wisconsin and Kansas, 108; Virginia, 107; Connecticut, Illinois, Missouri, and Oregon, 106; Delaware, Alabama, and Michigan, 105; Pennsylvania and Georgia, 104.

THE GRASS-CROP.

Though regular returns for the condition of the grass-crop, aside from clover, were not made June 1, yet references of our correspondents, in notes, to its general status in all parts of the country, were sufficiently numerous to show that the prospects for an abundant hay-crop were, at that date, very flattering. But limited and slight injuries from winter-killing were noted; the spring weather was generally very favorable for the "setting" of thick and vigorous coats of grass; and, except in Kentucky, injuries from drought had scarcely been felt.

The notes below will give local details respecting the condition and prospects of clover, spring pastures, and grass.

MAINE.—*Piscataquis*: Pastures and all grasses have started extremely well. *Waldo*: Grass is looking very fine—first rate. *York*: Grass but little winter-killed, and well set. *Androscoggin*: Grass and pastures are looking finely. *Aroostook*: Grass of all kinds came through the winter in excellent condition; promise of abundant crop of hay. *Cumberland*: About 5 per cent. of the clover winter-killed.

NEW HAMPSHIRE.—*Carroll*: Grass is looking well, though winter-killed by ice in the low lands. *Hillsborough*: The grass-crop never looked better. *Rockingham*: Pastures not badly winter-killed, but late. *Cheshire*: Mowing-fields and pastures looking finely.

VERMONT.—*Franklin*: Excellent season for the grass-crop. *Grand Isle*: Clover winter-killed. *Caledonia*: Clover badly winter-killed, and pastures to some extent.

MASSACHUSETTS.—*Berkshire*: Early rains in May were a great benefit to grass; pastures are excellent.

CONNECTICUT.—*New London*: Pastures very good.

NEW YORK.—*Westchester*: Pastures never looked better. *Albany*: Clover and pastures fine. *Saratoga*: Grass looks fine. *Wyoming*: Some clover winter-killed, but the crop looks well. *Sullivan*: Pastures superior. *Seneca*: Clover badly winter-killed. *Wayne*: The prospects for grass and clover better than average.

NEW JERSEY.—*Mercer*: Fine rains have had a wonderful effect on grass. *Sussex*: The open winter was very disastrous to young grass and clover. *Burlington*: Owing to last year's drought some fields have very little clover; that sown this spring looks well. *Camden*: Clover large, but thin; timothy yet quite small. *Warren*: Pastures a little short and backward; clover half a crop.

PENNSYLVANIA.—*Delaware*: Clover is well set and of vigorous growth; in grass we will be more than compensated for the short yield last year; pastures afford abundant food for stock. *Tioga*: Favorable weather has advanced the grass-crop far beyond expectation. *Beaver*: A dry and cold April hurt the pastures badly. *Clearfield*: Clover badly winter-killed, but doing better than was anticipated in early spring. *Monroe*: Grass looks fine. *Bedford*: Sufficient rain to keep grass growing; clover very good, though the drought last season destroyed most of that sown in the spring of 1875. *Sullivan*: Pastures and grass as forward as at the 20th of June last year. *Columbia*: Grass is late, but looking well. *Indiana*: Fine weather for the grass-crop, and grass and pastures doing finely. *Mifflin*: Clover-fields were much frozen out. *York*: Favorable indications of a more than average crop of hay. *Washington*: Spring pastures the best for years, and meadows are doing finely.

MARYLAND.—*Caroline*: Pastures are very good; clover never looked better. *Montgomery*: Grass promising, but a lack of clover. *Prince George's*: Spring pastures never better; the decrease in acreage of clover is owing to high price of seed; the clover which caught last year looks well. *Howard*: Hay and pasture will be short. *Hartford*: The hay-crop will be above an average.

VIRGINIA.—*Augusta*: Clover is heading very short. *Dinwiddie*: The farmers are generally seeding more clover this season. *Lancaster*: Clover and pastures were never better. *Loudoun*: Grass and clover look well. *Orange*: The present dry weather exceedingly unfavorable to grass. *Montgomery*: The season is most favorable for all kinds of grasses. *Madison*: Pastures good and clover better than last year, but the acreage less. *Floyd*: Grass-crop very promising. *Wythe*: Pastures and clover are not average.

NORTH CAROLINA.—*Forsyth*: Grass very fine; clover as good as need be; clover and the grasses have done finely. *Haywood*: Pastures looking very fine; our people are increasing their clover-fields every year.

SOUTH CAROLINA.—*Chester*: More attention to clover, which is very fine. *Newberry*: Clover luxuriant and thick.

GEORGIA.—*Troup*: Spring pastures good and cattle fat. *Carroll*: Pastures very fine.

FLORIDA.—*Gadsden*: Backward, owing to the dry winter, but rapidly improving.

ALABAMA.—*Jackson*: Pastures never better, particularly red clover and orchard grass. *Conceh*: Spring pastures good. *De Kalb*: Clover never presented a finer appearance. MISSISSIPPI.—*Perry*: Pastures 10 to 20 per cent. better than ordinary. *Jefferson*: Pastures splendid.

LOUISIANA.—*Franklin*: Spring pastures very good.

TEXAS.—*Washington*: Very good range or pasturage. *Collin*: Alfalfa has been planted in small lots and is doing finely; other clovers have proved a partial failure. *Cooke*: Prairie-grass very fine. *Nueces*: Grass is coming out finely, and stock of all kinds doing well.

ARKANSAS.—*Arkansas*: The range is excellent. *Ashley*: Fine pasturage; plenty of fat beef off the range. *Fulton*: Prairie-grass very fine, and cattle, sheep, and horses fat.

TENNESSEE.—*Williamson*: Pastures extra fine; very large increase of clover all over the county, and it looks well. *Lincoln*: Pastures, and especially clover, are unusually fine. *Gibson*: Spring pastures fine, and clover was never more luxuriant. *Monroe*: Spring pastures more than sufficient for the demands; clover magnificent. *Rhea*: Grass and clover better than for fifteen years. *Sullivan*: Grass and clover very fine. *Bedford*: Pastures fine, enough to supply the stock and leave a fine coat for fertilization. Clover very fine and now ready to cut. *Serier*: Pastures never so good before. *De Kalb*: Grass and clover were never better. *Granger*: Pastures very good; some early-sown clover killed by the freeze, but otherwise the crop is doing finely. *Greene*: Clover very thrifty. *James*: Clover and all the grasses promise well. *Bradley*: Pastures so rich that butter is selling at 15 cents per pound. Clover is exceedingly fine. *Giles*: Clover is increased 33 per cent. and is very fine.

WEST VIRGINIA.—*Grant*: Grass looks remarkably well. *Marion*: Meadows and pastures are having a very fine start; better than for five years. *Nicholas*: Grass looks well. *Mercer*: Grass of all kinds looking well. *Greenbrier*: Clover and blue grass are unusually fine. *Wetzel*: Clover will make a heavy crop. *Braxton*: Pastures,

grass, and clover very good. *Upshur*: Pastures never better. *Cabell*: Grass has suffered very much by drought. *Doddridge*: All grasses the best for many years. *Summers*: Pastures very good.

KENTUCKY.—*Bath*: A failure of the oat-crop for a few years past has caused an increased area in Hungarian grass. *Shelby*: Pastures at least one month late. *Calhoun*: Clover excellent. *Simpson*: Clover fine as ever known. *Spencer*: Pastures have suffered from dry weather. White blossom and white clover have appeared in great excess in timothy-meadows and clover-fields, and the hay-crop will be cut very short thereby. *Gallatin*: Clover and spring pastures have suffered from drought. *Meade*: Grass very short, owing to drought. *Nicholas*: Pastures and clover short, owing to drought. *Henry*: The great abundance of the weed known here as white blossom has entirely destroyed the timothy and clover crops. *Owen*: Clover and pastures reduced 10 per cent. by drought.

OHIO.—*Trumbull*: Grass looks very prosperous, and pastures are abundant. *Franklin*: A favorable season for the grasses. *Morrow*: Pastures are first rate, and meadows that were not frozen out promise fair. *Tinton*: Meadows never looked better. *Crawford*: Very flattering prospect for a large hay-crop. *Delaware*: Pastures never better, and clover full average. *Ross*: Fine prospect for clover and timothy. *Geauga*: The grass-crop promises to be the best for years. *Sandusky*: Good pastures.

MICHIGAN.—*Oakland*: Clover will be too large for profit. Pastures never better. *Kalamazoo*: Grass looks exceedingly well. *Calhoun*: Clover is most luxuriant. *Lenawee*: The weather has been good for grass-crops. *Shiawassee*: Pastures never better. *Van Buren*: The season favorable for grass and clover. *Mason*: Pastures look very fine. *Saint Joseph*: The grasses have a very fine start.

INDIANA.—*Noble*: Clover never much better. *Warren*: Pastures fine. The white blossom is taking the old meadows. *Whitley*: Pastures good. *Howard*: Clover suffered from winter-killing; pastures fair. *Crawford*: Suffering very much for want of rain. *Dearborn*: Seriously damaged by drought through May. *Hamilton*: Pastures are splendid; old clover badly winter-killed; young, looks well. *Lake*: The grass-crop very fine. *Wells*: Clover winter-killed. *Switzerland*: Pastures are excellent.

ILLINOIS.—*Macoupin*: Meadows and pastures are unusually good. *Clay*: Prospect of abundant crops in meadows and pastures. *Tazewell*: Pastures splendid. *Gallatin*: All the grasses look well. *Boone*: Clover in good order. *Clinton*: Clover was winter-killed. *Fayette*: All pasturage good. *Mason*: Clover good, but pastures short, owing to dry weather. *Jefferson*: Pastures the best for years; clover looks well; all grasses are fine. *Mercer*: Pastures and clover fine, but timothy scarce.

WISCONSIN.—*Waupaca*: Clover badly winter-killed. *Dodge*: Clover from which a crop of hay was taken last year generally killed; that seeded last year generally good. *Walworth*: Winter-killed.

MINNESOTA.—*Steele*: Grass is unusually good. *Stevens*: All wild prairies are in fine condition.

IOWA.—*Woodbury*: Our pastures are all of native grasses, which never winter-kill. *Hardin*: Pastures yield a big crop, and very nourishing; clover killed in spots. *Marion*: Pastures good, and meadows promise a good yield. *Ida*: More forward than common. *Appanoose*: Pastures very good. *Sac*: The prairie pasture is very good.

MISSOURI.—*Platte*: Pastures never better. This spring the farmers sowed many acres of clover, which promise a rich harvest. *Pettis*: Splendid pastures. *Morris*: Meadows never better. *Reynolds*: Grass-meadows are fine.

KANSAS.—*Cowley*: Grass looks fine. *Osage*: Pastures very fine; many cattle now excellent beef. *Cherokee*: Pastures excellent. *Douglas*: Wild grasses look as well as grain and sunshine can make them.

CALIFORNIA.—*Yuba*: Spring pasturage grand, owing to a large amount of early rains. There is an increase of alfalfa, the only clover raised here. *Santa Clara*: The hay-crop a little more than average, with a heavy percentage of the old crop on hand. *Sonoma*: Better than for twenty years; dairymen are reaping a rich harvest. *Kern*: Have finished cutting the first crop of alfalfa. *Mendocino*: A very fine prospect for hay, which the farmers are now busy in cutting. *Stanislaus*: About ten times more hay has been cut in this county than ever before. *Amador*: There is a constant increase in the acreage of alfalfa. The several crops cut in a year amount, in some instances, to nine tons per acre; usually to five or six. It makes very nutritious hay. *Butte*: The condition of pastures and alfalfa is all that could be desired. *Napa*: The reported increase of alfalfa, 10 per cent., is probably an underestimate. Our pasture grows during the winter and early spring. It becomes dry by the first of June, but retains its nutritiousness, and may properly be called "natural hay."

OREGON.—*Columbia*: Pastures never better.

COLORADO.—*El Paso*: Pasturage superabundant, and stock of all kinds have done exceedingly well, except that they have suffered from the hard storm, May 23.

DAKOTA.—*Davison*: Pastures are looking well. *Buffalo*: No rain in three months, and as a consequence, poor pasturage.

WASHINGTON.—*Walla-Walla*: The grass and hay crops are very fine. *Whitman*: The native pasturage is unusually fine, and all kinds of stock are doing finely.

FRUIT.

The apple crop of the New England States is generally above average. In York, Maine, myriads of caterpillars hatched out about May 20, but the subsequent cold weather appears to have effectually disposed of them. In Oxford, last year, they left a record of damages behind them.

In the Middle States the bloom was abundant; the apples are above average and peaches below, the peach regions of Delaware reporting a very depressed prospect. Other kinds of fruits are promising.

Of the South Atlantic States, Maryland promises a full crop of apples and at least a half crop of peaches. In Virginia both these fruits are less prosperous. A cold spring with hard freezes following a mild winter, in several counties, cut down a previous fine prospect; apples are less than an average and peaches one-third. South Carolina complains of extensive injuries by frost. In Pitts a blight injures the ends of the limbs and the fruit; apples eight-tenths of an average and peaches one-half. The freeze extended to South Carolina and Georgia, though fair crops are expected on high lands. Warm winter succeeded by cold in spring caused great destruction in some localities. These States promise about three-fourths of a crop of apples, and less than half a crop of peaches.

The Gulf States are still more chary of promise to these two crops, but in the tropical and semi-tropical parts of Florida there is fair promise. In Santa Rosa unusual alternations of warm and cold weather caused successive bloomings on peach-trees. Autauga, Alabama, complains of a small insect injuring fruit, boring into the sprig just below the bud. In several counties, in the Gulf region, severe frosts were felt. In East Baton Rouge, Louisiana, the thermometer falling to 29° , strange to say, the bananas escaped, while the peaches, plums, and nearly all the grapes were killed, and apples and pears greatly injured; whereas, in previous winters, when the thermometer has fallen as low as 19° , neither tree nor fruit of these varieties was injured, while bananas were entirely killed. Severe frosts were noted also in Texas.

The inland Southern States indicate about eight-tenths of an average crop of apples, but not over a fourth of a crop of peaches. Here untimely frosts did their work with greater effect in many sections from the warmth of the winter.

The States north of the Ohio will, on the whole, probably turn out a full crop of apples, the deficiency in Illinois and Indiana being more than made good by the large surplus in Michigan and Wisconsin; Ohio is above average. Injuries from frost seem to have been more local in their character in this region, though several counties complain of them as severe. Michigan will have a full peach-crop, but the others not one-half average.

Of the States west of the Mississippi River, the northern portions promise a surplus crop of apples, while Missouri and Kansas drop below average. Iowa will have an unusual crop of peaches, while Missouri and Kansas will be about half average. Untimely frosts are noted in the southern sections, together with local hail-storms.

On the Pacific coast, California promises a full crop of apples and a surplus of peaches; Oregon a full crop of apples, but not quite of peaches.

MAINE.—*Fiscataquis*: Apples but just leaved out. *York*: The bloom abundant. Myriads of caterpillars hatched about the 20th of May, but the cold weather killed all. *Androscoggin*: Just coming out, with a fair prospect. *Cumberland*: Not yet in full

bloom; will be very full. *Oxford*: Showing but very little bloom, owing to ravages of caterpillars last year. *Somerset*: Have not yet blossomed.

NEW HAMPSHIRE.—*Carroll*: Apples will blossom well. *Hillsborough*: Apples promise a very large crop. *Rockingham*: Apples in full bloom, and a promise of an abundant crop. *Cheshire*: Apple-trees loaded with blossoms.

VERMONT.—*Franklin*: Not yet in bloom. *Grand Isle*: Just in bloom; poor prospect.

MASSACHUSETTS.—*Berkshire*: In bloom, and make an excellent show.

CONNECTICUT.—Prospect of a very large crop.

NEW YORK.—*Westchester*: Full of blossoms. *Albany*: The trees are white with blossoms. *Washington*: Abundant bloom. *Lewis*: Just show the bud. *Saratoga*: The trees heavy-laden with bloom. *Wyoming*: Now in full bloom. *Sullivan*: Trees have bloomed exceedingly well. *Genesee*: Just in bloom, which is very full. *Albany*: All fruit-trees covered with blossoms. *Genesee*: Apple-bloom very full; no pear-blossoms; small fruits promising. *Seneca*: Bloom good, but injured by east wind. *Wayne*: Better than average.

NEW JERSEY.—*Sussex*: Indications of a large crop. *Burlington*: A great amount of bloom, but the young fruit is dropping off badly. *Warren*: Enough healthy-looking young apples to make a good crop. *Mercer*: Wonderful prospect for all kinds of fruit. *Camden*: Small fruits promising.

PENNSYLVANIA.—*Bucks*: Abundant bloom, and the fruit setting satisfactorily. *Lycoming*: Promise a full crop. *Sullivan*: Promise an abundant crop; never better. *Indiana*: Have set well, and promise of enormous crop. *Warren*: Good prospect for a full crop. *Elk*: Enormous bloom. *Northampton*: Promise good. *Wyoming*: Best prospect for ten years. *Armstrong*: Promise good. *Indiana*: Crop will be enormous, especially apples and cherries; pears have set well. *Mifflin*: Prospect good.

MARYLAND.—*Caroline*: Falling off. *Prince George*: Promise of an abundant crop. *Cecil*: Promise far above average in quantity. *Gloucester*: Prospect of a very heavy crop.

VIRGINIA.—*Fluvanna*: A mild winter, followed by killing frosts, will make the crop very short. *Page*: Almost entirely cut off by freeze the last of April. *Halifax*: Fruit nearly all destroyed by late frosts. *King George*: There was ice on the morning of May 1. There are no peaches on the grafted trees, but many on seedlings. A promise of many cherries, Seckel and Bartlett pears and apples. Berries promise to be plentiful. *Floyd*: Almost a failure. *Elizabeth City*: Cherries are abundant, and unusually good and cheap. Strawberries have quite glutted the local market, having sold as low as 3 cents per quart. Grapes also promise well; the vines look thrifty and are loaded with young fruit. *Northampton*: The good prospect for a fruit-crop was seriously damaged by the freeze in the latter part of April. *King and Queen*: The fruit-crop will be a good one. *Craig*: Killed by May frost. *Roanoke*: Fair crop. *Ashe*: Larger part killed. *Scott*: Very promising. *Lancaster*: Below average. *Fairfax*: Apples will be abundant. *Pulaski*: Largely frost-killed. *Patrick*: Half crop of apples and still falling off. No peaches. *Carroll*: Best prospect yet. *Frederick*: Peaches generally killed by late frosts. *Halifax*: Nearly all killed; only seedlings escaped the frost. *Amelia*: Frosts about the 1st of May, killed the few which had escaped the earlier cold. *Craig*: Killed by frost in May. *Fairfax*: May be half a crop. *King George*: The best grafted varieties killed by the frost, but the old seedlings are full of fruit. *Pulaski*: Killed by frost. *Madison*: Promise of half a crop. *Prince Edward*: Only a few. *Augusta*: Generally killed. *Greenville*: Cut off by late frosts. *Roanoke*: Nearly all killed.

NORTH CAROLINA.—*Moore*: Killed by late frosts. *Beaufort*: Will be half a crop in quantity, but of superior size and quality. *Gaston*: None. *Fancy*: All killed by a freeze, March 22. *Caswell*: Almost a failure. *Union*: Almost destroyed. *Yadkin*: Fruit all killed by the freeze. *Edgecombe*: Very scarce, but doing well. *Person*: Nearly all killed. *Ashe*: All killed by the freeze. *Richland*: Entirely destroyed by the freeze. *Orange*: Almost a failure. *Madison*: All killed. *Guilford*: All killed. *Union*: Badly injured by frost. *Yadkin*: All the early apples destroyed in the bud. *Alamance*: Half a crop. *Buncombe*: All peaches and early apples killed; prospect of a good crop of late. *Duplin*: The borer doing much damage to the trees; many killed outright. *Edgecombe*: Very scarce, but doing well. *Person*: Nearly all killed. *Pitt*: A species of blight has attacked the apple-trees, appearing in the ends of the smaller branches and in the fruit-bearing branches generally. It threatens to destroy much of the fruit. *Orange*: Promised well, but have dropped off badly. *Guilford*: But very few; killed by frost. *Lenoir*: Fruit-trees loaded. *Harriet*: Frost killed.

SOUTH CAROLINA.—*Chester*: A fair crop on high ridges. *Clarendon*: Almost all destroyed by the freeze in March. Insects very destructive to early branches of peach-trees. *Lexington*: Good, but in some cases young apples and ends of limbs are destroyed by insects.

GEORGIA.—*Worth*: All killed by the freeze in March. *Macon*: The remarkably warm weather of mid-winter caused the buds of the apple and peach trees to swell and become tender, and then the cold in the latter part of January harmed them. The ends

of the twigs were killed, the trees seemed to go back into winter-quarters for good, and they actually remained there five to eight weeks later than usual. They then put forth considerable bloom, giving the hope of some fruit; but most of the blooms were defective, and the few fructified have been destroyed by the curculio. *Marion*: The fruit-crop will be almost an entire failure. The peaches were so stunned by the cold in the spring that some have just put forth their leaves. Many were entirely killed. *Laurens*: All kinds almost an entire failure. *Troup*: Injured by frost, but a promise of half a crop of fine fruit. *Montgomery*: All kinds very much injured by the cold spring. *Henry*: Peaches a failure; half crop of apples. *Rabun*: Much cut off by spring cold. *White*: Peaches, a total failure; apples, promising. *Taylor*: Extreme cold weather in March reduced the crop. *Towns*: All killed by cold. *Dooly*: Nearly all killed by the freeze. *Gordon*: Killed by frost. *Wayne*: A total failure. *Gwinnett*: Killed by a snow the last of March. *Randolph*: Almost a failure. *Richmond*: A few orchards are laden with fruit in profusion, while others will not produce a bushel to the acre. *Elbert*: Materially injured by a late frost. *Macon*: Near a total failure. *Cobb*: Entire failure. *De Kalb*: Nearly all destroyed by the freeze in March. *Stewart*: Materially damaged by the freeze. *Walton*: Very near a failure. *Richmond*: Apple trees greatly blighted. *Barlow*: Many apple-trees blasted and leaves turned black. *Fayette*: Many trees damaged. *Cobb*: A blight or something else has appeared on the trees, which is causing the apples to fall off very fast. The small twigs on which the apples are die two or three inches back.

FLORIDA.—*Putnam*: The prospect for the orange-crop is good. Watermelons are coming in freely, of very fine quality. *Santa Rosa*: Owing to unusual alternating of warm and cold weather, we have on same trees peaches of three different bloomings and of corresponding sizes. Some of the trees which had not bloomed up to the time of the first freeze, the latter part of February, did not until the 15th to the 20th of May. Indeed, on some trees blooms are to be seen even up to this time. *La Fayette*: All fruit destroyed by freeze, March 19. *Columbia*: Badly frosted.

ALABAMA.—*Macon*: Almost an entire failure. *Perry*: Badly frosted. *Calhoun*: Spring frosts. *Butler*: Injured by cold spring following warm winter. *Randolph*: Very fine. *Dale*: A total failure; apple and peach trees just now leafing out and blooming; many are dead; no one can account for it. *Covington*: Prospect of a failure; just as the trees were blooming, in February, the coldest spell of the winter froze the opening buds. *Blount*: In some localities, none; in others a full crop. *Randolph*: Plenty. *Conecuh*: In full bloom at this time—later than ever known—and the hot sun is causing the fruit to drop. *Autauga*: A large bloom, but a small insect, not larger than a flea, bored into the sprig just below the bloom and killed the entire sprig. *Lauderdale*: Almost a failure. *Butler*: Seriously injured. *Coffee*: Almost an entire failure. *Greene*: Short crop.

MISSISSIPPI.—*Amite*: Fine, except peaches. *Covington*: Nearly a failure owing to late frosts. *Choctaw*: Not more than 50 per cent. of last year's crop. *Jefferson*: Nearly all frost-killed. *Lauderdale*: Cold spring. *Lee*: March cold, destructive. *Rankin*: Almost a failure. *Wilkinson*: Many trees killed by March freeze. *Adams*: Badly damaged; a failure. *Covington*: Peaches nearly a failure. *Lauderdale*: Peaches a failure. *Lincoln*: Peaches destroyed by frost. *Choctaw*: Only 25 per cent. of a crop of peaches, wing to the freeze. *Perry*: Late frosts caused a failure in peaches.

LOUISIANA.—*East Baton Rouge*: The freeze, March 19 and 20, destroyed all the peaches and plums, nearly all the grapes, and greatly injured apples and pears. The grapes are again putting forth shoots, and there will be about a fourth of a crop. Not only were the fruit-buds on the peach-trees killed, but the leaf-buds and the entire trees were so injured that they are even yet destitute of foliage. The new leaf-buds are just beginning to appear. The thermometer descended only to 29°. What is strange, it did not kill the bananas, while in past winters we have had the thermometer as low as 19°, entirely killing the bananas, but not injuring tree or fruit of apple, pear, peach, plum, or grape. *Richland*: The fruit-crop much damaged by frost; peaches and pears have suffered most. *Lafayette*: Fruit-crops almost a total failure, owing to the severe freeze March 21. *Jackson*: The freezing weather destroyed in a great degree the fruit, particularly plums and early peaches. *Franklin*: Full 60 per cent. of apple-bloom blasted. *Moorehouse*: Nearly all frost-killed. *Jackson*: Half crops. *Bienville*: Early peaches destroyed by freezing. *Franklin*: Peaches very late in blooming, and 60 per cent. blasted. *Moorehouse*: Nearly all the peaches destroyed.

TEXAS.—*Llano*: Materially damaged by late frosts. *Upshur*: Early peaches all killed. *Bandera*: Peaches half frost-killed. *Titus*: Badly damaged by frost, and apples and pears also, by blight. *Washington*: All grafted and imported fruit-trees completely failing; supposed to be owing to late cold and freezes; seedlings will generally bear. *Ellis*: Peaches almost a failure, through frost. *Jacinto*: Peaches a failure. *Wood*: Somewhat injured by late frost. *Gonzales*: Nearly a failure, owing to late frosts—peaches and grapes. *Burnet*: Peaches mostly frost-killed. *Austin*: Peach-crop nothing. *Collin*: Cut short by late frosts. *Polk*: Badly injured by frost. *Anderson*: Except apples, nearly average, all fruit greatly injured by premature blooming and subsequent freezing. *Nacogdoches*:

Fruit is a failure, owing to the cold weather in March. *Wood*: Apples fine. *Panola*: Apple-trees late leaving, some still leafless. *Navarro*: Will be a full crop of fruit in some localities, and in others contiguous all was destroyed by frost. *Marion*: While the peach-crop is indifferent, the grape and berry crops are excellent. *Burleson*: Apple-trees half destroyed by frosts. *Upshur*: Destructive cold. *Panola*: Peaches a small crop.

ARKANSAS.—*Baxter*: All killed March 20. *Dallas*: Killed by the freeze and snow in March, when the thermometer went 12° below the freezing-point. *Izard*: The cold storm in March destroyed nearly all the fruit and injured the trees. *Prairie*: The heavy snow in March killed nearly all the peaches and plums, and many of the trees. *Yell*: Pear-trees are dying all over the county. *Cross*: All kinds, except a few apples, killed by snow in March. *Craighead*: Nearly a failure. *Jefferson*: Slight prospect. *Saint Francis*: Cut off at least one-half. *Jackson*: The early apples are killed. *Ouachita*: What are on the trees very poor, and not more than 10 per cent. of a crop. *Sharp*: Greatly damaged by the freeze. *Woodruff*: Good. *Arkansas*: May make a fair crop, but there is something unnatural; some trees have on one part apples as large as quails' eggs, while the other part is in early bloom. Have seen it so in several orchards. *Franklin*: Peaches nearly all killed. *Sebastian*: Peaches killed. *Benton*: All peaches killed. *Van Buren*: All peaches killed by a big snow in March. *Hempstead*: Peaches mostly killed by late frosts. *Monroe*: Peaches all killed by freeze in March. *Jackson*: Peaches nearly all killed. *Stone*: Peaches killed. *Crittenden*: Peaches all killed. *Crawford*: Peaches killed. *Independence*: Peaches injured by the snow-storm in March. *Perry*: Entirely destroyed by the freeze. *Sharp*: Peaches killed. *Ashley*: Peaches killed. *Yell*: Peaches all killed. *Marion*: Peaches a total failure.

TENNESSEE.—*Lewis*: All killed in March. *Williamson*: Nearly all killed. *McNairy*: Almost a failure, owing to a heavy snow in April. *Loudon*: All dropping off. *Craighead*: Peaches a failure. *Saint Francis*: Entire failure. *Monroe*: Total failure. *Tip-ton*: Entire failure. *Bedford*: Almost a failure; killed by the late freeze. *Greene*: Scattering; April chills caused them to fall off. *Giles*: All but 5 per cent. killed. *Fayette*: Nearly all killed by 8 inches of snow March 18. *Lauderdale*: Peaches almost a failure. *McNairy*: Partly killed by heavy snow in April; those left look rather unhealthy. *Loudon*: Will be a light crop. *Grundy*: The frost mostly killed the winter and summer apples, but the fall-apples suffered but very little. *Monroe*: Good. *Bedford*: Exceedingly abundant. *Greene*: A thin crop. *James*: Will be a full crop. *Giles*: Immense crop now on the trees. *Mauzy*: All kinds abundant, except peaches. *Serier*: Small fruits extra good.

WEST VIRGINIA.—*Nicholas*: Very light crop. *Putnam*: Three-fourths of peaches destroyed by the cold in March. *Preston*: Apples bid fair for a good yield. *Wetzel*: Apples bid fair to be very abundant; peaches few. *Braxton*: Peaches a small crop. *Taylor*: Fine prospect. *Brooke*: Prospect of an extra crop. *Cabell*: Early apples a failure; late, a fair crop. *Summers*: The prospect very good on the low land; light on the uplands. *Pendleton*: The crops materially injured by the late cold. *Randolph*: Nearly an average bloom, but falling off. *Calhoun*: Not a good crop. *Hardin*: Very few. *Owsley*: Promise of 75 per cent. of a crop. *Spencer*: Cut short by frosts. *Galatin*: Half a crop. *Grant*: A fine prospect. *Nicholas*: Very light crop of apples and cherries, and no other fruit. *Tucker*: Will not be much fruit of any kind. *Cabell*: Pears and plums, as well as peaches, a failure. *Pendleton*: Severe frosts materially injured the apple crop, and entirely destroyed peaches, plums, and cherries. *Mercer*: Peaches killed.

KENTUCKY.—*Anderson*: Very few peaches. *Jefferson*: Peaches destroyed. *Calhoun*: Peaches very scarce. *Hardin*: None. *Owsley*: All killed by the snow and freeze March 20. *Spencer*: Nearly destroyed. *Gallatin*: Prospect of half a crop of apples, peaches, and other fruits. *Nicholas*: Peaches almost a failure. *Henry*: Such fruits as escaped the frosts are doing well.

OHIO.—*Greene*: A freeze in April almost destroyed our prospects for fruit; and besides this, a web-worm is almost ruining many orchards by stripping the trees of their foliage. *Trumbull*: All kinds except peaches bid fair to be an immense crop. *Athens*: Apples, peaches, and small fruit, except grapes, badly injured by freeze May 1, and again by a severe hail-storm May 21. *Morrow*: Apples promise fair, but other fruits will be scarce. *Finton*: A frost, May 1, killed all the peach, and on low ground, most of the other fruit; on high ground, there will be half a crop of apples, and some pears and cherries. *Delaware*: The measuring-worm is going for our fruit. *Portage*: Peaches, plums, cherries, and the more tender fruits killed to a great extent by frosts. *Hardin*: Pears and peaches a failure; cherries promise well. *Medina*: Other fruits than peaches promise abundantly. *Monroe*: Cherries half a crop; small fruits. *Ross*: Peaches a failure. *Monroe*: Very few peaches. *Preble*: Never more promising. *Williams*: An unprecedented bloom. *Ashland*: Frosts destroyed some early apples. *Crawford*: Fair prospect. *Hamilton*: Prospect of a good crop, except peaches. *Noble*: Not over half a crop. *Portage*: Never more promising. *Hardin*: Promise well. *Ross*: Half a crop. *Huron*: Bid fair for a big crop. *Wood*: Two-thirds the bloom destroyed by frost, but enough left for a good crop. *Geauga*: Promise of the heaviest crop for

many years. *Sandusky*: Good outlook. *Meigs*: Frosts killed many of the early peaches. *Franklin*: Peaches killed.

MICHIGAN.—*Ionia*: Many of the trees have been killed by recent severe winters, but those left promise a full crop. *Oakland*: Fuller blossom than ever before seen. *Lenawee*: A very full bloom. *Shiawassee*: Promise better than for some years. *Grand Traverse*: A very full bloom all over the county. *Muskegon*: Three-fourths of the peaches killed. *Ottawa*: All kinds promising. *Wayne*: Prospect never better. *Mason*: Prospect fine.

INDIANA.—*Whitley*: Never a finer bloom, but the fruit has not set well as was hoped. *Franklin*: Trees unusually full of bloom, but fruit not abundant. *Howard*: Prospect of apples above average, peaches mostly killed. *Floyd*: The crop will be large. *Hamilton*: A full bloom of apples but fruit falling off badly; peaches a fair crop. *Carroll*: Apples and peaches much damaged by frosts. *Washington*: Peaches an entire failure, except on budded trees. *Kosciusko*: Fruit prospects were never more promising until within two weeks; since which, have had an east wind almost continually, and at least 50 per cent. of the apples have fallen off, and a large per cent. of the cherries. *Noble*: The prospect for fruit is good. *Floyd*: Small fruits very abundant; a few early peaches and no late ones. *Cass*: Killing frosts May 22d and 23d, badly injured the finest of fruit prospects. *Lake*: Fruit has the best showing ever known. *Wells*: Frost May 7th, killed fruit to a considerable extent. *Madison*: All fine except the peach-crop.

ILLINOIS.—*Boone*: Blossomed profusely, but owing to cold and wind will not be more than average crops of fruit. *De Kalb*: Fruits of all kinds promise well; cherries, a good crop, and grapes above average; apples 20 per cent. below average. *White*: Fruit killed by the cold weather in March. *Logan*: Apples not setting well, falling off. *Bureau*: Prospect of the largest crop of apples ever raised, though some complaint of dropping off. *Tazewell*: Canker-worms have appeared in a few of the large orchards. The prospects for small fruits splendid. *Clinton*: Apples injured by frost. *Fayette*: Prospect very good. *Mason*: Short crop of apples. *Sangamon*: Apples falling off badly. *Jefferson*: Half a crop of apples. *Hancock*: Half the apples have dropped off. *McLean*: Apples have dropped off badly. *Logan*: Peach-trees badly winter-killed. *Mercer*: Few peach-trees, but well loaded.

WISCONSIN.—*Green Lake*: Promise a large crop, especially of apples. *Richland*: Fullest blossom for years. *Washington*: Promise of an abundant crop. *Greene*: Promise abundant.

IOWA.—*Woodbury*: There are a great many young orchards not yet in bearing, all doing well. The few in bearing have done well, and will produce some fruit. *Hardin*: Promise a very heavy yield. *Clayton*: Never a better prospect. *Iowa*: Our few trees full. *Jefferson*: The fruit prospect is the finest for years; all kinds promise abundantly. *Sac*: In this new county the orchards are young, but some apple and cherry orchards just coming into bearing give great promise.

MISSOURI.—*De Kalb*: Every kind promises a large yield. *Clay*: Fruit short, owing to a freeze after the buds were partially opened. *Pettis*: Half a crop of cherries and a fair crop of grapes. *Johnson*: Very little fruit, owing to storm and cold the last week in March. *Barton*: Peaches and all small fruits killed by the freeze in March. *Jefferson*: The prospect is good for cherries and grapes. *Calloway*: Fruit has dropped off the trees badly. *Laclede*: Peaches nearly all killed. *Pemissot*: Peaches all killed. *Stone*: Fourth of a crop. *Christian*: Not good. *Stoddard*: Killed. *Saint Genevieve*: All killed, except a small percentage of very hardy seedlings. *Chariton*: Peaches killed. *Mississippi*: Peaches all killed in some parts. *Polk*: Peaches killed. *Cass*: Apples and peaches nearly all destroyed by three hail-storms. *Jefferson*: Poor prospect. *Dallas*: Peaches a failure; apples injured by hail. *Butler*: Apples and peaches half killed by the frost. *Laclede*: Apples nearly all killed. *Platte*: Scarcely 25 per cent. of a bloom. Now a small worm, $\frac{3}{4}$ of an inch long, called by some the canker-worm, is making sad havoc among the apple-orchards, eating all the leaves and destroying the apples. *Stone*: Half a crop of apples. *Holt*: A bug, allied to the chinch, injured the apple-blossoms. They were very numerous in some orchards. The canker-worm has stripped a few orchards in the eastern part of the county of their leaves and fruit. The codling-moth is the principal enemy of the apple in this part of the country. The destruction by them equals fully 20 per cent. of the crop. *Perry*: Half a crop of apples, and still falling off. *Pettis*: Three-fourths of a crop of apples. *Stoddard*: Most of the apples killed by a freeze. *Saint Genevieve*: Late frosts very destructive. *Charidon*: Apples killed.

KANSAS.—*Shawnee*: Fruit destroyed by hail. *Cowley*: Peaches killed. *Osage*: Almost a total failure. *Barbour*: Prospect of apples greater than ever before. *Doniphan*: Apple-blossoms injured by a small brown bug; peaches killed. *Cherokee*: About the first crop of apples raised is doing well; peaches a failure. *Brown*: Destroyed through the center of the county by a violent storm. *Douglas*: Some appearance of blight on the trees. *Labette*: Rose chafer did much damage to early apples. *Elk*: Peaches killed. *Brown*: Peaches destroyed. *Montgomery*: Peaches killed on bottom-lands; a few on uplands.

NEBRASKA.—*Hall*: Fruit generally promising. *Richardson*: Fruit-crops generally failed. *Nemaha*: Destructive hail-storm.

CALIFORNIA.—*Sonoma*: Fruit promising; vintage promises a large and excellent yield. *Yuba*: Crops short. *Placer*: Better than for many years. *Batte*: Excellent. *San Joaquin*: All good; grape crop will be enormous. *Amada*: Injured by terrific storm.

OREGON.—*Clackamas*: Injured by cold.

UTAH.—*Kane*: Prospects never better. *Utah*: Injurious frost. *Beaver*: Injurious frost.

ARIZONA.—*Maricopa*: Better than ever before; figs bearing full.

MAPLE SUGAR AND MOLASSES.

The product of maple-sugar during the past season declined about 10 per cent. from the product of the previous season. The only States that equaled last year's aggregate were Massachusetts, Connecticut, Pennsylvania, and Michigan. The decline in maple-molasses has been at about the same rate. Only Pennsylvania, Ohio, Michigan, and Indiana equaled last year's product. The gradual decline of this branch of production is attested by the late census reports. In 1870 we produced 28,443,645 pounds of maple-sugar and 6,503,323 gallons of molasses; in 1860 we produced 40,120,205 pounds of sugar and 14,963,996 gallons of molasses—a decrease of 11,676,560 pounds of sugar and of 8,460,673 gallons of molasses in ten years.

COWS.

The condition of cows is above average in every State of the Union except Oregon, which reports 98 per cent. The highest condition is found in the States west of the Mississippi River, and the maximum, 113, in Kansas. On the Atlantic slope, Georgia reports 7 per cent. and Maine 6 per cent. above average. In New England and Middle States the range is slightly above; the South Atlantic States a little higher. The winter was generally favorable on the Atlantic slope for cattle. Forsyth, Georgia, reports a disease of unknown character that had been two weeks raging at the date of the report. In some parts of Florida the dry winter had dwarfed the grasses, but, generally, the condition was good. Alabama and Texas report 8 per cent. above average. The southern inland States indicate an unusually good condition, averaging somewhat above the States north of the Ohio River. The dairy section of Michigan seems unusually well satisfied with the condition of cows, while in many localities in Indiana better care of this class of farm-animals, including better shelter, is noted. The same improvement is also indicated in the States west of the Mississippi River, where the merciful policy is illustrating its superior economic value. An unusually mild winter, however, greatly assists in bringing about this result. On the Pacific coast, California is 3 per cent. above average and Oregon 2 per cent. below.

MAINE.—*Waldo*: Looking remarkably well. *Androscoggin*: More being kept than usual, and they have come out very finely.

MASSACHUSETTS.—*Berkshire*: Look well.

NEW YORK.—*Albany*: Fat. *Washington*: Came out in excellent condition, and are giving extra quantities of milk.

VIRGINIA.—*Patrick*: Lean, owing to scarcity of food in the spring, but improving.

GEORGIA.—*Taylor*: The cattle on the range are in fine order. *Forsyth*: Some disease has made its appearance in the last two weeks; twelve or more cattle have died, mostly milch-cows. *Worth*: Cows have thrived well, owing to the mild winter. *Wilcox*: The dry winter and forward spring very favorable for cows, which are doing well—much better than last year.

FLORIDA.—*Gadsden*: Condition bad, owing to the dry winter which dwarfed the grasses.

TENNESSEE.—*Bedford*: Fat.

KENTUCKY.—*Gallatin*: In better condition than for several years.

MICHIGAN.—*Lenawee*: Doing better in the dairy section than ever before.

INDIANA.—*Franklin*: Better cared for than usual, in the winter, which more than made amends for the lack of straw and rough feed. *Switzerland*: Never looked better.

MISSOURI.—*Platte*: Came through the winter in fine condition, and are repaying richly; milk and butter are in great abundance.

SHEEP.

The average rate of losses of sheep by disease or other casualties varies greatly in different sections. The New England States range from 3 to 6 per cent., Connecticut showing the minimum rate of the whole country. The Middle States lost about 5 per cent. The South Atlantic States range from 4 per cent. in Maryland to 10½ per cent. in Georgia, the latter being the maximum of the whole country. Virginia reports 7 per cent.; the cause of this heavy loss is partly indicated by our correspondent in Patrick, who says that a large number of lambs were lost by neglect, the farmers relying upon the unusually favorable winter. The sharp, cold weather recurring in spring also contributed to this result. The Gulf States range from 5½ per cent. in Louisiana to 9 per cent. in Alabama; the southern inland States, from 4 per cent. in West Virginia to 10 per cent. in Arkansas. Bedford, Tennessee, reports stock-sheep in unusually fine condition, with a perceptible decrease of vicious dogs. This nuisance explains the high rate of destruction in the South generally. North of the Ohio River the rate of loss ranges from 4 per cent. in Michigan to 7 per cent. in Illinois. In Calhoun, Michigan, lambs are not developed as well as usual; losses have been especially severe among high grades. West of the Mississippi River, Missouri and Nebraska lost at the rate of 8 per cent., while Kansas lost but 4 per cent.; Minnesota and Iowa, 5 per cent. Saunders, Nebraska, lost 22 per cent., 20 of which were through the ravages of dogs. Our correspondent here had 484 killed in one night; he afterward lost 200 lambs, leaving him almost "muttonless." Pawnee County lost heavily from floods, one farmer losing 100 sheep and 150 lambs. On the Pacific coast, California lost 7 per cent. and Oregon 4 per cent. El Paso, Colorado, reports a loss of 5 per cent. from a storm May 23, when, on what is called "the divide," the snow fell to the depth of 15 inches.

VIRGINIA.—*Patrick*: Greater loss of lambs than ever known, ascribed to neglect induced by the favorable winter.

TENNESSEE.—*Bedford*: Stock-sheep are in better condition than I ever saw them; are burdened with fat. We have more and better sheep and fewer dogs than ever before.

MICHIGAN.—*Calhoun*: Complaint that lambs dropped are not usually well developed; are not strong and healthy. Losses have been much greater than usual, especially among high grades.

NEBRASKA.—*Saunders*: Of the 22 per cent. loss among sheep, 20 per cent. is directly chargeable to dogs. The reporter had 484 killed in one night, and afterward sustained a loss of about 200 lambs, which had been left motherless. *Pawnee*: The loss of sheep was caused by their being carried off in high water from excessive rains. One man lost over 100 old sheep and 150 lambs.

COLORADO.—*El Paso*: A loss of 5 per cent., including lambs, from a storm of unusual severity, occurring May 23. On what is known here as the divide, snow fell to the depth of fifteen inches, and in Summit Park, at the head of Ute Pass, to the depth of two feet.

NEW HAMPSHIRE.—*Carroll*: Quite a number have died from grub in the head. Is there no remedy that will destroy the worm and save the sheep?

VERMONT.—*Caledonia*: Early-sheared sheep suffered severely from sudden changes from very warm to extreme cold weather. One farmer lost 24 out of 36, and others lost more or less. Early shearing is a cruel, and, as a rule, a very unprofitable practice.

PENNSYLVANIA.—*Wyoming*: Never knew sheep to do as well before. Almost every flock has doubled, and some I know have trebled. *Washington*: Doing splendidly on the abundant pasturage. Now being sheared, and are turning off fleeces a shade heavier than usual.

Table showing the condition of the crops, &c., on the 1st day of June, 1876.

States.	WINTER WHEAT.		WINTER RYE.		WINTER BARLEY.	SPRING WHEAT.		SPRING BARLEY.		OATS.		SPRING PASTURE.	
	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.	Average condition June 1.
Maine	98	99	99	99	100	100	100	99	99	100	100	100	100
New Hampshire	96	93	93	93	98	98	100	99	99	101	101	101	101
Vermont	72	94	94	94	99	99	100	101	101	100	100	100	100
Massachusetts	100	103	103	103	100	100	100	102	102	105	105	105	105
Rhode Island	85	96	96	96	100	100	100	100	100	101	101	101	101
Connecticut	92	97	97	97	87	87	100	100	100	99	99	99	99
New York	96	91	91	91	94	94	100	100	100	99	99	99	99
New Jersey	92	92	92	92	104	104	100	100	98	100	100	100	100
Pennsylvania	105	100	100	100	100	100	100	100	100	92	92	92	92
Delaware	108	102	102	102	100	100	100	100	100	96	96	96	96
Maryland	112	101	101	101	100	100	100	100	100	95	95	95	95
Virginia	104	101	101	101	100	100	100	100	100	112	112	112	112
North Carolina	93	94	94	94	102	102	100	100	100	136	136	136	136
South Carolina	84	85	85	85	100	100	100	100	100	94	94	94	94
Georgia	88	82	82	82	100	100	100	100	100	98	98	98	98
Florida	75	91	91	91	116	116	100	100	100	104	104	104	104
Alabama	89	90	90	90	107	107	100	100	100	97	97	97	97
Mississippi	75	82	82	82	111	111	97	97	94	103	103	103	103
Louisiana	79	91	91	91	88	88	113	113	94	107	107	107	107
Texas	73	89	89	89	107	107	98	98	102	100	100	100	100
Arkansas	100	98	98	98	100	100	100	100	100	89	89	89	89
Tennessee	106	103	103	103	93	93	90	90	81	100	100	100	100
West Virginia	92	95	95	95	85	85	103	103	99	93	93	93	93
Kentucky	66	76	76	76	21	21	116	116	99	102	102	102	102
Ohio	100	96	96	96	97	97	105	105	100	96	96	96	96
Michigan	66	86	86	86	88	88	99	99	89	97	97	97	97
Indiana	78	91	91	91	95	95	101	101	101	102	102	102	102
Illinois	77	93	93	93	110	110	101	101	101	100	100	100	100
Wisconsin	77	89	89	89	97	97	95	95	96	99	99	99	99
Minnesota	86	94	94	94	101	101	106	106	96	101	101	101	101
Iowa	87	95	95	95	112	112	92	92	102	99	99	99	99
Missouri	96	95	95	95	103	103	98	98	102	103	103	103	103
Kansas	108	107	107	107	104	104	100	100	107	102	102	102	102
Nebraska	110	103	103	103	106	106	107	107	107	101	101	101	101
California	97	101	101	101	97	97	100	100	96	102	102	102	102
Oregon	104	105	105	105	95	95	100	100	96	97	97	97	97

Table showing the condition of the crops, &c., on the 1st day of June, 1876—Continued.

STATES.	CLOVER.		MAPLE SUGAR AND MOLASSES.		COWS.	SHEEP.	APPLES.	PEACHES.	COTTON.	
	Average comp'd with last year.	Average condition June 1.	Product of sugar this year compared with last.	Product of molasses this year compared with last.					Average comp'd with last year.	Average condition June 1.
Maine.....	99	102	91	90	106	5	95	.....	.....	.....
New Hampshire.....	98	97	87	92	101	4	106	100	.....	.....
Vermont.....	97	91	86	91	101	6	102	.....	.....	.....
Massachusetts.....	101	104	103	98	103	4	112	105	.....	.....
Rhode Island.....	100	105	.....	.....	100	10	125	160	.....	.....
Connecticut.....	101	99	95	90	101	3	120	80	.....	.....
New York.....	100	96	93	91	103	5	107	88	.....	.....
New Jersey.....	98	83	.....	.....	100	6	116	89	.....	.....
Pennsylvania.....	100	90	104	105	102	5	108	92	.....	.....
Delaware.....	107	105	.....	.....	100	5	110	20	.....	.....
Maryland.....	99	98	.....	.....	102	4	101	51	.....	.....
Virginia.....	104	105	93	91	105	7	92	31	.....	.....
North Carolina.....	104	103	.....	.....	104	10	83	48	.....	.....
South Carolina.....	101	103	.....	.....	107	6	79	32	.....	.....
Georgia.....	103	103	.....	.....	107	10	77	38	.....	.....
Florida.....	107	101	.....	.....	101	6	57	64	.....	.....
Alabama.....	123	102	.....	.....	108	9	72	51	.....	.....
Mississippi.....	.....	.....	.....	.....	105	8	66	27	.....	.....
Louisiana.....	.....	.....	.....	.....	101	11	62	38	.....	.....
Texas.....	109	106	.....	.....	108	7	74	52	.....	.....
Arkansas.....	105	102	.....	.....	105	10	82	16	.....	.....
Tennessee.....	108	112	79	87	108	4	89	36	.....	.....
West Virginia.....	103	109	99	90	103	4	82	30	.....	.....
Kentucky.....	123	98	98	90	104	8	81	32	.....	.....
Ohio.....	105	101	98	101	101	5	105	50	.....	.....
Michigan.....	106	104	101	100	105	4	124	101	.....	.....
Indiana.....	100	100	93	104	101	6	87	57	.....	.....
Illinois.....	102	105	96	93	102	7	92	52	.....	.....
Wisconsin.....	88	93	81	77	105	5	125	.....	.....	.....
Minnesota.....	99	95	76	78	107	5	108	.....	.....	.....
Iowa.....	102	103	85	82	105	3	115	111	.....	.....
Missouri.....	105	107	77	.....	109	8	82	54	.....	.....
Kansas.....	113	104	.....	.....	112	4	86	45	.....	.....
Nebraska.....	128	105	.....	.....	106	8	106	67	.....	.....
California.....	120	101	.....	.....	103	7	100	122	.....	.....
Oregon.....	103	100	.....	.....	98	4	101	92	.....	.....

EXTRACTS FROM CORRESPONDENCE.

FARM PROSPECTS.—*New York, Wayne* : Better prospects for all crops never existed.

Maryland, Worcester : Our crops generally very promising, and stock is in good condition.

Virginia, Sussex : While the average in oats and clover is increased from 10 to 20 per cent., the area planted in cotton is 25 per cent. less. In this I think our planters have evinced wisdom, for the balance of their lot-lands is not left uncultivated, but is planted in tobacco, pea-nuts, field-peas, beans, and other crops not hitherto planted to any extent.

North Carolina, Moore : Crops are generally well cultivated, and the season is very favorable. *Transylvania* : Crops are looking well. *Lenoir* : A fine winter and spring for farm-work. The good farmers have their crops well forwarded, and our prospect is very promising. *Camden* : The season has been favorable, the stand of all crops is good, the farmers are fully up with their work, and the prospect for good crops is flattering.

South Carolina, Chester : Labor is plentiful, cheaper than usual, and efficient. Crops will be grown at less expense to the planter than last year. *Marlborough* : The labor is very good and abundant, and the only complaints now are want of provisions and the low price of cotton. *Williamsburgh* : All our crops have done remarkably well, and are in a very promising condition.

Georgia, Liberty : Money is scarce and the times are hard, but the prospect for crops is good, and labor is abundant. *Schley* : Labor plentiful and cheap ; \$4 to \$8 per month, or 10 to 40 cents a day and rations. The crops of corn and cotton look well. *Gwinnett* : Our farmers still have "cotton on the brain," although the price has gone down to 10 cents ; but they are paying more attention to provision-crops, hogs, etc. The weather is unusually propitious for the growing crops. *Richmond* : Labor is plenty and cheap, and work is done with decidedly more efficiency than formerly. Prospects for farmers are unusually bright ; few could obtain factors' accommodations ; hence the crops, when harvested, will, in great measure, remain in the producers' hands, something which has not happened the last ten years. *Hancock* : Less cotton planted than for years, and a larger area of corn and small grain than since the war, which are looking very fine. *McDuffie* : The farmers are turning their attention from cotton, making it only as a surplus crop. The weather is fine for harvesting wheat and oats, which was commenced a few days ago. *Wilcox* : This year farmers have gone less into cotton, and more into grain and potatoes. *Dodge* : A very favorable season for the crops. *Hart* : The crops are in a healthier and better condition than in many previous years. *Troup* : The land was never better prepared for planting ; crops have been well cultivated, and are in good condition. *Lincoln* : The season has been as favorable as could be desired ; the work is well up, and, on the whole, the prospect is more cheering than for years past. Farmers are beginning to see and feel the necessity of self-reliance and home-support, as shown by the slight abatement of the cotton-crop and the stronger grasp for grain-crops and live-stock. *Jefferson* : Crops are clean, and looking well. More wheat, oats, and corn, and less cotton, planted than in any year since the war.

Florida, Liberty : In the upper half of the county the earth has not

been wet to the depth of 4 inches within seventeen months. Vegetation is, consequently, suffering seriously from drought.

Alabama, Perry : The season is promising, the crop prospects are very good, and the farmers unusually hopeful. *Randolph* : "King cotton" has been king of ruin to farmers. We have no money, but aim to have bread and meat, with which we can live without money. *Russell* : I hear but little complaint of laborers so far. Less stock has been killed and stolen than in any year since the war; owing principally to having better laws, and better men to execute them. The low price of cotton will eventually prove a blessing. It has caused many to plant more corn, potatoes, pease, &c. *Escambia* : All the crops are in very good condition.

Mississippi, Greene : The weather is now warm and vegetation is growing well. The stands are good, there is no complaint of insects, and the crops are looking finely. *Tishomingo* : Laborers are working well, the weather is seasonable, and the crop prospects are above average. *De Soto* : There is considerable attention to stock-raising and grass-growing, and I believe our agriculture will soon change for the better.

Texas, Washington : Many farmers are buying corn at 50 cents per bushel with money obtained from the sales of cotton at 8 cents per pound. No wonder that our southern people are becoming poorer yearly.

Texas, Austin : All grain-crops are light, in consequence of a drought of six weeks; no rain from the first week in April until the 21st of May. Pastures have been considerably injured, but stock of all kinds is in excellent condition. The young apple-orchards planted of late years are beginning to bear, but the mild winter kept the trees too long in a growing condition. This has caused all fruit-trees to be very late in blooming, and considerably diminished the amount of bloom. *Fort Bend* : Continued dry weather for ten weeks has blighted agricultural prospects very much in this portion of the State. *Matagorda* : Crops generally are very unpromising. Tremendous floods of rain in February and March—a most unusual occurrence—caused the plowed land to run together again; and then on the cessation of rain, immediately high, drying winds baked them so hard that there was an impossibility to obtain stands. Not a drop of rain has fallen for seven weeks. *Medina* : There was not a drop of rain from the middle of March to the middle of May, which fact reduced the condition of all crops. *Marion* : Not a day's suffering for rain this season, and crops are better than for three years past.

Arkansas, Sebastian : Crop prospects were never better at this season. We are gradually decreasing our cotton-crops and increasing our cereals. Stock is in fine condition, and sheep are healthier here than in any other place I have lived in. *Scott* : The prospects for good crops of corn, cotton, and oats throughout the county are very flattering.

Tennessee, Williamson : Stock of all kinds is looking well. The passage of a dog-law has given a great impetus to sheep-raising. Farmers are getting a better class of sheep and taking better care of them. The seed of German millet, which makes excellent hay, has been quite a profitable crop in this county. Last year it brought as high as \$5 per bushel, but this year only 50 to 75 cents. *Rhea* : The prospects for grain, clover, grass, &c., are better than in any season for fifteen years. Stock is in fine order, and in fact everything looks prosperous for the farmer. *Sullivan* : Taking all things together, the outlook for the farmers is very encouraging. *Grainger* : All things considered, we have

more than an average prospect for crops. *Knox*: Complaints of bugs, worms, &c., are fewer than usual; the spring has been exceedingly favorable to the farmer, and while he may fail in some of the crops he can reasonably hope for a bountiful harvest.

West Virginia, Tucker: A great interest is taken this spring in putting in crops; more grain has been sown than for several years past, and crops of all kinds look well.

Ohio, Madison: All small grains, except oats, are almost a failure.

Michigan, Delta: For the last two weeks the weather has been all that could be desired, and everything in the line of crops is looking well. *Wayne*: The past few weeks have been very favorable, and crops of all kinds are looking remarkably well.

Minnesota, Douglas: We never had better prospects of a large crop of grain. *Sherburne*: All crops except winter grain are in a splendid condition. *Wabasha*: The very late spring and wet condition of the ground impeded seeding; after seeding, heavy rains washed badly the rolling lands and left many farms in poor condition for crops; never since the settlement of the county have crops so early in the spring been damaged so badly. *McLeod*: More than twice as much land as usual will be broken this spring; the abundant crop and good prices of wheat last season greatly encourages farmers. *Renville*: Crops are farther ahead than ever before at this season of the year. *Stearns*: At no time since our settlement in this State has the season been so early for seeding or the weather so fine for the growing grain as at present; crops never looked more promising. *Todd*: This is the best growing season for small grains for ten years.

Iowa, Dallas: We have had a very wet spring. Previous to the 15th of May we had such frequent rains that it was almost impossible to get the ground in suitable condition for any crop. Consequently a diminished area of wheat, oats, and barley was sown. *Woodbury*: Farmers are giving less attention than heretofore to wheat, and an immense acreage, from new breaking of prairie, is devoted to corn, an increase of 25 per cent. in this county. *Marion*: Much less than usual of spring-wheat, oats, and barley was sown, as it was impossible, owing to wet weather, to sow at the proper time. *Des Moines*: The ground is in the worst condition for making crops ever known. The past winter was characterized by a succession of very heavy rains, and no frost to disintegrate the soil. The result is a very poor show for small-grain crops. I have seen no field of small grain that has over half a stand, and the ground is nearly as solid as the road. *Fremont*: We never had so great an acreage in small grain as this spring, and the prospect was never better. *Pocahontas*: The season is very favorable for crops of all kinds.

Nebraska, Franklin: The weather has been very seasonable and there never was a better prospect for crops in the county since it was settled. *Adams*: There are no indications of grasshoppers, and the condition of all crops was never better. *Richardson*: A splendid prospect for good crops, especially of small grains. The chinch-bug has appeared in a few localities. *Wayne*: The prospect for good crops of small grain was never better. *Dixon*: No grasshoppers yet, and crops of all kinds are in good condition and promise first rate. *Dawson*: The prospects for everything have been never better since the county was settled. *Knox*: Showers have been frequent and all the small grains are in splendid condition. *Cuming*: The prospects for small grain, though late, were never better. Corn has an excellent color and has a good start. *Seward*: The weather has been very seasonable and a more hopeful condition of crops could not well exist. A marked improvement in husbandry

is observed. *Nemaha*: Everything is as auspicious and encouraging as could be desired except the fruit, which was badly beaten off by hail.

California, Sonoma: The high percentage reported on all cereal crops is owing to the fact that the present season has never been equaled since the settlement of California by the Americans. The yield of wheat and barley will be unprecedentedly large; the acreage of corn is very largely increased, and the yield will be proportionably large. The pastures are better than for twenty years, and dairymen are reaping a rich harvest of golden butter. Fruit promises to be very abundant; the vintage gives promise of being exceedingly large and of excellent quality. *Napa*: The grain-crops are all above average, both in acreage and yield per acre.

Utah, Weber: The season was very late and nearly all spring crops are backward, but all cereals are very promising and stock is improving rapidly after the unusually long and tedious winter. *Toole*: We never had a better season, and everything looks splendid; prospect of the heaviest crops since the county was settled.

PROGRESSIVE AGRICULTURE.—*North Carolina, Beaufort*: This county has made one good step in the right direction. Formerly large quantities of northern hay were imported; but for the last two years the supply of forage from home production has been abundant.

Indiana, Switzerland: The policy of hay-cropping without giving the land anything in return is being gradually but surely abandoned, and farmers are taking steps to convert their farms into stock farms. Raising and fattening stock will be extensively engaged in hereafter. There is now an unprecedented and still increasing demand for stock-cattle, hogs, &c.

Wisconsin, Columbia: Our farmers are turning their attention more and more every year to cultivated crops, and by feeding their corn to cattle, sheep, and hogs, make more manure to return to the soil as a compensation for its favors.

Minnesota, Pope: Although the winters are so long and generally so severe, the raising of herds of cattle and flocks of sheep is found on the whole to pay better than the production of wheat, corn, and oats for the market. Dairying prospects begin to look encouraging. The manufacture of butter and cheese will soon greatly increase, judging from present indications.

Kansas, Washington: The alfalfa sown last year has proved a grand success. It was three feet high by the middle of May, and farmers then commenced cutting the first crop. The attention now given to alfalfa and other grasses will revolutionize farming in Kansas. Before its introduction we made a specialty of our wheat to our own detriment. We are now raising more rye, corn, and grass, and selling our products in cattle, hogs, &c., which places us on the high-road to prosperity.

IMPOVERISHING RESULTS OF SPECIAL FARMING.—*Kentucky, Pendleton*: Tobacco is the curse of this county. It is causing the lands to become quickly worn out and the rising generation to be a set of ignoramuses.

Tennessee, Perry: With a soil and climate exceedingly well adapted to the growth of cotton, tobacco, all kinds of fruits, the cereals, and all kinds of stock, thereby guaranteeing the greatest meed of success in diversified husbandry, and a large, navigable river traversing our western border, affording the very cheapest transportation to first-class markets, we have too long made the growing of peanuts a specialty. The growing

of this crop has driven us to the granaries and meat-houses of the Northwest for our subsistence, has destroyed our thrift, is threatening to destroy the fertility of our soil, and has otherwise damaged us far more than the calamities of our late civil war; and yet it is planted this year in an increased acreage of, perhaps, 200 per cent. above an average. A few farmers, educated in the precepts of diversified husbandry, would soon grow opulent here in furnishing our farmers with breadstuffs, meats, fruits, vegetables, wool, and farm-stock.

GRASSHOPPERS.—*Texas, Burnet* : Cereals have been partly destroyed by grasshoppers. *Gillespie* : The grasshoppers hatched here, left on the 8th of May. *Llano* : Wheat has been considerably damaged by the grasshopper.

Minnesota, Watonwan : Grasshoppers deposited eggs here last fall, which have now hatched, and the young hoppers are very plenty in places, but up to this time they have not done any material damage to the growing crops. Owing to the fear of this pest, less than half the usual acreage in wheat and oats was planted this spring. *Jackson* : Owing to the deposit of grasshoppers' eggs last season, but little grain was sown in the north part of the county this spring. *Nobles* : In three towns in the northeast part of the county young grasshoppers have already done considerable damage where the ground was not plowed in the fall, and where the grain was sown in corn-stubble the crop is wholly destroyed. *Redwood* : Crops of all kinds promised a bountiful yield; but the great pest, the grasshoppers, are hatching out in certain localities, and threaten total destruction. *Blue Earth* : In the southwestern towns of the county grasshoppers are hatching out in large numbers. They are already doing considerable damage to all kinds of grain and to timothy meadows.

Iowa, Shelby : Wheat is suffering from young grasshoppers; in some places they have entirely destroyed it, but as yet not more than 2 per cent. of the acreage.

Colorado, Rio Grande : Grasshoppers are hatching out in large numbers.

Montana, Deer Lodge : The grasshoppers are out by millions, and damaging spring crops, wheat more than any other. *Lewis and Clarke* : Grasshoppers are appearing very plentifully. *Jefferson* : The grasshoppers very thick.

New Mexico, Taos : The grasshoppers have appeared in this valley in myriads. *Mora* : Grasshoppers have destroyed 40 per cent. of the spring wheat.

DISEASES AMONG FARM-ANIMALS.—*North Carolina, Gates* : Nearly all the hogs are dead or dying of hog-cholera.

Georgia, Decatur : There has been some fatality among the horses. It seems to be staggers, produced by the kind of food given them. Corn raised here last year is very light, chaffy, and deficient in the elements of nutrition. In this county such food is a recognized cause of blind staggers. A few persons lost every horse. Hogs have continued to die of the disease known as hog-cholera. It is said that hogs fed mainly on cabbage, colewort, ruta-bagas, and turnips are not subject to this disease.

Arkansas, Prairie : Since my last report we have lost fully half the hogs we had left. I have no doubt that the disease was from worms, and that with ordinary care very little loss would have been sustained. Not enough hogs are left for stock.

Tennessee, Monroe : A few sheep are dying of disease. Cholera prevails among swine, proving fatal in many localities.

Illinois, Macoupin: More hog-cholera than for the past three years.

Kansas, Woodson: A disease called the strangles is prevailing in several localities, which has killed a number of fine horses. The first symptoms are manifested by an itching of the head, which causes the horse to rub the head and neck violently against anything within reach. This is soon followed by a swelling in the muscles of the jaw, which extends upward until the lower jaw and throat are tightly swollen. The horse begins to strangle, as though choking, and grows worse for about five days, when he ceases to breathe. No one seems to understand the disease, and no remedy has yet been discovered.

INSECT-INJURIES TO APPLE-TREES.—*Alabama, Saint Clair*: This spring, on a number of apple-trees, a short time after the bloom appeared, a small insect, like a black flea in appearance, bored into the limb near the bloom and deposited its eggs. This caused the bloom to perish, and the limb died back from 4 to 12 inches. The trees thus injured look as if almost dead, there are so many dead leaves hanging to them. The borer confined itself principally to certain kinds of fruit. This is the first thing of the kind we have ever had.

OVERFLOW.—*Louisiana, Concordia*: From careful inquiry, I think at least three-fourths of this parish is under water. At date, May 21, it has fallen 10 inches, but goes down very slowly. In the back part of the parish there will be a good deal of suffering.

NEW VARIETY OF APPLES.—*Austin, Texas*: A new variety of apples has originated on the farm of Dr. Becker, of Frelsburgh, which is propagated by suckers, and succeeds admirably. The trees perfected a second crop last winter.

FATALITY AMONG DOGS.—*Tennessee, McMinn*: Farmers are paying more attention to sheep since the law has passed taxing every dog \$1 and every slut \$5. An affidavit to the death of a dog pays the tax on him, and there have been about 150 affidavits filed with the county collector for 1875.

A STOCK COUNTY.—*West Virginia, Greenbrier*: This county is better adapted to stock-growing than to grain. Cattle, sheep, and horses are extensively raised. We sell annually about 3,000 fat cattle, averaging 1,100 pounds, at 4½ cents. Stock of all kinds are now in good condition, and promise to get fat early.

RAVAGES ON SHEEP.—*Mississippi, Winston*: I turned out my sheep last spring and lost two-thirds of them; this spring I turned out my flock, and within one week all my lambs disappeared—killed by wolves or dogs. The sheep are diminishing every year; the farmers have almost given up raising them. One of my neighbors, who has generally kept 75 to 100, told me, three days ago, that he had only 2 left—all killed by dogs, wolves, or freedmen.

Georgia, Hall: Since the war, sheep-raising has proved a failure. This is a good sheep-growing county, but the freedmen seem determined that dogs shall monopolize it. Before the war I kept a fine flock of about 100; now I have none—have been compelled to quit by the dogs, the poor white man, and the negro.

HAIL-STORMS.—*New Jersey, Sussex*: On the evening of May 21, we suffered terribly in several parts of the county from a storm of hail and rain. Some of the hail-stones were of the size of a small hen's egg. Glass in windows of church, conservatories, &c., suffered very much. The leaves were stripped off the trees, gardens were ruined, roads washed out, and bridges destroyed.

Nebraska, Knox: A very heavy hail-storm, May 20, passed through this county from the southwest. The leaves and some of the bark of the trees were removed; all the garden vegetables and flowers were totally destroyed; all the plants from the tree-seed obtained from the Department were also destroyed; the grass and small grain were cut short, but I think were not permanently injured. The ground was covered about 2 inches on the level with stones of a large size. Prairie chickens and birds after the storm were found dead.

THE EUCALYPTUS—*Florida, Orange*: I have now 15 varieties of the eucalyptus growing finely. Our soil and climate seem to suit them exactly, and no doubt in time they will become most valuable as shade and timber trees, to say nothing of their medicinal or anti-febrile properties. Seeds of the *Eucalyptus globulus*, received from the Department one and a half years ago this month, have made trees 23 feet in height and six inches in diameter.

IMMIGRATION—*Michigan, Chippewa*: Many farmers are coming into our county from Canada. Though generally poor, we hope the resources of the county will soon be brought up, at least toward the desired standard. There are not yet over fifty farmers in the county.

Minnesota, Chippewa: Thousands of claims are being located this spring, and soon Western Minnesota will be one immense wheat-field.

CROSS-BREEDING OF GRAIN.

BY THE COMMISSIONER.

In this age of enterprise and thought, when science is casting so much light upon the operations of men, and when the study of the best and most profitable modes of performing the work of the world is becoming more essentially necessary to the production of successful results, the farmer is especially called upon to bestow industrious thought as well as laborious labor upon the work which he is daily called upon to perform. It is not enough that he should know that seeds cast upon the earth will germinate, grow, ripen, and produce fruit, but that his hand, which guides, aids, and stimulates this natural process, should itself be guided by the knowledge of the nature of the seed itself, how it germinates, how it grows, how it ripens, and how and why it produces fruit. This knowledge will enable him to give a right direction to the effort and labor which he bestows upon it, in order to obtain the most profitable results. The thought and conviction that frequent plowing and stirring of the soil is important to its fertility, because the earth itself is a set of mouths and lungs which feed upon the natural elements of the air, and imbibe its moisture and light and heat, induces him to the performance of the work in the promotion of his own interest. That seeds are characterized by good and bad is a thought which should always lead to a careful selection, for as like will, throughout all nature, produce like, so will the hopes or fears of the farmer be realized by the character of the seeds he sows or the tree he plants. A small and shriveled grain of wheat, when sown, will produce a weak and unhealthy stock, and a corresponding failure of product, while a plump, bright grain will exhibit its healthy and vigorous growth and abundant product. It is certainly true that many of the maxims of farmers, upon which they thoughtlessly base their action, have no foundation in sound

reasoning. That to change seed from one kind of soil to another will produce a profitable result is a maxim of almost universal acceptance, nor does the farmer stop to reason with himself as to its soundness or fallacy.

Here is the point at which farmers fail to bring into requisition their own powers of reflection, or even to use the evidence of their own practical experience. They do not stop to inquire as to the effect of removing seed from a soil and climate to which it has been naturalized and adapted, to that, to which it is not natural and to which it has not been accustomed; and they fail to remember that when they go abroad for seed, and pay a higher price for it, it is to obtain a quality better than their own, and commensurate with the price they pay for it, and that herein lies its superiority; that it amounts to nothing more than an imperfect mode of selection.

Another maxim which farmers generally accept as an axiom is, that by sowing wheats of different qualities together, that they will so hybridize as to produce a mixed breed; while even a little observation would teach them the error of this conclusion, and that each grain produces its own like, and that really no hybridization takes place at all, and that the mixture of seed produces the unmitigated evil of mixing wheats which perhaps ripen at different periods, or perhaps require different treatment when they come to be reduced to flour.

A little study of the nature of plants would seem to be necessary to a knowledge of their proper treatment during their growth. Of the flowers of plants some are male and some female. In some the staminate and pistillate flowers occupy different parts of the same plants, as in Indian corn. In the larger number of plants the male and female organs mature at the same time in the same flower; and of these some are subject to self-fertilization, and others to cross-fertilization. Such plants as pease, beans, wheat, and barley have the male and female organs within themselves, and are not subject to cross-fertilization, and therefore it is that wheats do not mix their qualities at all by being planted together; and as it is objectionable for other reasons, it should never be done. The leaf or flower which protrudes from the glume of wheat is neither an anther, a pistil, nor a stamen, and neither emits nor receives the fertilizing pollen.

CHEMICAL MEMORANDA.

BY WILLIAM MCMURTRIE, CHEMIST.

BAT GUANO.—In a previous report of the Department I had the honor to submit the results of an analysis of a sample of bat excrement taken from a deposit near Huntsville, Ala., and the interest manifested in them, and the reports of other deposits received, from time to time, seemed to render it advisable to issue a circular-letter to the regular correspondents of the Department in the South, asking for information concerning the existence of such deposits, with complete descriptions of their location and extent. To these letters we have received replies of a very favorable character, many of them being accompanied with samples of the deposits described, developing the fact that the deposits were not confined to any particular section of the South, but that they exist in many of the States from Virginia to Texas, several of

them being of considerable extent. It was believed by many persons before the war, and by officers of the confederate government during the war, that they would prove to be a valuable source of niter, and were worked for the extraction of this compound. Some of the attempts in this direction proved successful, but very many of them resulted disastrously, as might be expected from the low percentage of nitric acid in some of the samples, and its complete absence in others, and, at the close of the war, all enterprise in this direction was abandoned. They will, however, be a profitable source of fertilizing material, since their mechanical condition is favorable to their ready removal and application to the soil. Most of them contain fair percentages of organic nitrogen, while some of them contain both actual ammonia and nitrates. Microscopical examination of the material shows it to consist of the remains of the hard parts of insects in a finely comminuted condition, which are the source of its nitrogenous constituents. Many of these remains are in such a fair state of preservation that the species of insects to which they belong may be determined.

Before proceeding to further descriptions of the samples received by the Department, and a statement of their analysis, I will detail some of the information concerning the deposits, as furnished by our correspondents.

Mr. J. Layne, McDowell, Highland County, Virginia, reports caves containing deposits on the lands of the following gentlemen: John T. Armstrong, 2; Samuel Armstrong, 2; Jonathan Lirons, 1; H. C. Jones's property, on Cave Mountain, 2 or more; on property of James Woods, on Jackson's River, 1. Mr. Layne states that from all of these caves large amounts of saltpeter were made during the war, and vast quantities of fertilizing material could be obtained from them at any time.

Mr. R. E. Talbot, Georgetown, Williamson County, Texas, sent samples of deposit, with the following statement: "I inclose a sample of bat excrement from the cave of William K. Foster, two and a half miles from Georgetown. The amount of the deposit is large, supposed to be hundreds of tons. Many apartments of the cave are filled to the mouth, making it impossible to tell how extensive the cave is, or the amount of excrement in it. For a space of about 100 yards long by 20 yards wide, near the mouth, it is from 6 to 10 feet deep."

Mr. S. B. Thornton, Tuscumbia, Ala., reports "a deposit in a cave three miles west of that place, worked by a gentleman, who considers the deposit worth \$20,000. The cave is 80 or 90 feet deep. Material from it has been tried upon corn with very favorable results."

Mr. Hugh J. Brady, Spencer, Tenn., sent a sample taken from an extensive deposit found in a cave, one division of which "measures one mile in length and 50 feet in width. This is the main room. The cave has been surveyed for a distance of three miles. A New York company manufactured saltpeter from the deposit for a number of years, but finally failed." The deposit is believed to be of great value.

Mr. H. Weir, San Antonio, Tex., writes:

I sent you by express October 26, one can of "bat guano," containing about ten pounds, taken from my cave, about twenty miles northeast of this city. There is a large deposit in this cave, say fifteen or twenty thousand tons, and yearly increasing. I should be pleased to get your analysis of this sample, and will cheerfully give you any further information you may desire with regard to this cave, or others in this section.

Mr. William H. Bayne, postmaster at Batesville, Ark., reports one cave in his vicinity which contains a large deposit of bat excrement, and is at present the resort of immense numbers of bats.

Mr. P. A. Kendrick, Brierfield, Bibb County, Alabama, reported a

cave on Six Mile Creek, in Bibb County, and, in response to a request for a sample of the deposit, sent it with the following communication :

In reply to your favor of September 9, I would say I have visited the cave in question, and forward by to-day's mail samples of excrement of bats and dirt from the floor of the cave. This material was used by the confederate government during the war, for manufacture of saltpeter. Both the dirt and the excrement are found in large quantities.

The entrance to the cave is 10½ feet high and 20 feet wide. Thirty feet from the entrance the interior is about 15 feet high, and here commences a series of rooms containing the dirt and manure. A tram-road, used by the confederate government, runs a quarter of a mile into the cave, but beyond this it has never been explored. Its extent is, therefore, unknown. It is in a limestone formation, and situate seven miles from the Selma, Rome and Dalton Railroad, and half a mile from Six Mile Creek.

Mr. J. A. V. Pue writes from Bandera, Tex. :

In reply to circular of May 27, 1875, I have the honor to state that there is a bat cave situated on West Verde Creek, about 8 miles southwest from Bandera, on a survey belonging to Joseph Ney. During the war large quantities of saltpeter were manufactured from it for a time, when it was fired accidentally or designedly. It is now a mass of ashes, from 3 to 5 feet in depth, as far as it has been explored—a distance of about 400 yards. The width of the cave is from seven to thirty feet. The deposit has never been used for agricultural purposes.

Subsequent to the time of writing the above, Mr. Pue forwarded, by request, to the Department a sample of bat excrement of fair quality, as is evident from the statement of analysis given below.

Besides the sources already mentioned, we have received specimens from Mr. L. A. Downs, Cave City, Ky., and from Benton County, Arkansas. We have made analyses of seven of the specimens received, and their composition is detailed in the following table :

	I.	II.	III.	IV.	V.	VI.	VII.
Sand, clay, insoluble silicate	1.068	82.29	0.46	2.153	1.885	0.447	62.660
Moisture	36.300	2.59	9.17	26.710	44.330	0.425	14.020
Organic volatile matter	46.77		82.18	58.439	47.73	92.745	6.144
Alumina and sesquioxide of iron	0.356	8.06	0.17		0.463		
Soluble phosphoric acid	0.541	2.02	1.52	0.125	1.833	1.691	
Insoluble phosphoric acid	3.600		0.67	3.866	0.581	0.909	0.711
Lime	6.428	2.92	1.86		0.710		
Magnesia	0.666	0.38	0.38		Trace.		
Sulphuric acid		0.61	1.16		2.161		
Chlorine		Trace.	0.38		0.202		
Nitric acid			Trace.		0.258		
Potassa	1.590	Trace.	0.67	1.471	0.590	0.763	0.0707
Soda	0.750	Trace.	Not det.	0.425	0.312	0.160	0.152
Soluble silica		0.41					
Organic nitrogen	5.336		7.96	0.556	6.000	10.091	0.199
Amonia (N. H.) corresponding to organic nitrogen				0.675	7.28	12.253	2.2416
Actual ammonia	0.598		1.24	0.132	2.013	0.472	
Undetermined	1.531			6.511			

The Roman numerals, at the top of the tables, represent different samples as follows:

I. Sample from Brierfield, Ala. Part of the deposit from which it was taken was burned during the war, but this sample represents that portion which remains uninjured.

II. Sample from same deposit representing the remains of the burned portion. It has the appearance of dry, sandy soil.

III. Sample from Bandera, Tex.

IV. Sample from San Antonio, Tex.

V. Sample from Benton County, Arkansas.

VI. Sample from Georgetown, Williamson County, Tex.

VII. Sample from Cave City, Ky.

These are all very similar in appearance, with the exception of those

containing the high proportion of insoluble mineral matter, which are very much like soil. Those containing high proportions of organic matter vary in color from light brown to dark brown according to the percentage of moisture they contain. As stated before, their physical condition, when air-dried, is excellent, both for handling and for application to the soil, and the analyses given above represent very fairly the average composition of the material, which may be valued at from \$15 to \$55 per ton, reckoning upon the basis for determination of the value of fertilizers adopted by Dr. Ch. A. Goessmann, inspector of fertilizers for the State of Massachusetts, in his report for 1876. These values compare favorably with those of the fish-products largely manufactured in New England, and even with Peruvian guano, analyses of both of which may be found in the report just alluded to. With these facts before us we may readily recognize the importance of the development of these deposits in the South, where fertilizing materials are so much needed and are so costly, and especially is this true when they may be obtained from this source for the mere cost of removal.

INFLUENCE OF LIME-SALTS IN PLANT-GROWTH.—Joseph Boehm has lately conducted a series of experiments to determine the value of lime-salts in the economy of plant-growth, and has found that its principal function appears to be that of furnishing nourishment for support of the development of the cell-walls, without assisting in any way in the direct production of starch. According to the results obtained by other investigators, the function of the formation of starch in the chlorophyl-grains must be delegated to potash. This latter function cannot, however, according to Boehm, be carried on in the absence of lime-salts, since plants grown in potassic chloride, carbonate, or phosphate alone grew no better than those to which only distilled water was supplied. Germinating plants will grow as long as they can obtain nourishment from the reserve stock of food in the parent seed, but it appears that the mineral elements become exhausted before the organic elements are all elaborated, and that, for complete development of the plants, mineral matters must be added to the soil or solutions in which they are grown. Experiments with various alkaline salts, in absence of lime, proved them to be unable of themselves to supply the deficiency, and in many cases they were absolutely poisonous. This was found to be true of carbonate of magnesia, confirming the results of an investigation into the physiological action of magnesia, made in the laboratory of this Department. The poisonous action of magnesia-salts may, however, be neutralized by carbonate of lime.

But when the alkaline salts were applied in presence of lime, the growth was vigorous and healthy, and he therefore believes that lime-salts are as essential to the change of starch to sugar, &c., in building up cell-walls which constitute the skeleton of the plant, as it is in the animal economy in the metamorphosis of the cartilage of the bones.

With regard to the value of potash, the author quotes from Nobbe that potash is essential to plant-growth, and that it is a condition of the formation of starch in the chlorophyl-grains. The chloride is considered the best form in which to apply it to the soil, and next to this compound the nitrate, while the sulphate and phosphate are considered positively injurious.

From these statements it would therefore appear that the combination of lime-salts with potash-salts is the most favorable combination for the stimulation of the growth of plants.

MICROSCOPIC OBSERVATION.

By THOMAS TAYLOR, MICROSCOPIST.

CELLULOSE AND STARCH IN PLANTS AND ANIMALS. (Continued from the July Report for 1875.)—As cellulose and starch have very important relations to man and the lower animals as food-constituents and in other respects, I have deemed it advisable to continue my investigations on these substances.

1. Fig. 1 represents a fiber of cotton in its natural condition; 2, a fiber subjected to the action of strong sulphuric acid; 3, a fiber on which was first placed a drop of a strong amber-colored solution of tincture of iodine, followed by a drop of commercial muriatic acid, and immediately afterward by a drop of concentrated sulphuric acid. In consequence of the combinations of the sulphuric acid with the water of the muriatic, the liquid boils two or three seconds, and by this chemical action the cellulose or cotton-fibers are quickly changed in their structure and chemical composition. When viewed under a power of about 100 diameters, the fibers will be found to have been reduced to a starchy condition, and in many cases will appear in the form of disks or beads of a well-defined blue color; 4 represents a fiber of flax in its natural condition; 5, when treated with concentrated sulphuric acid; 6 and 7, when acted on by the tincture of iodine and acids, as described in the case of cotton-fibers. Membranous cellulose and also amorphous may be stained blue in the same manner, but they retain their original forms. To illustrate this, saturate a few grains of bleached flax in commercial muriatic acid, then add, by degrees, concentrated sulphuric acid, and stir the mixture with a glass rod until the mass becomes pulpy or partially dissolved; then add to it an excess of water and let it stand for several hours to allow the cellulose to precipitate, after which decant off the clear water. This process of adding water or washing must be repeated several times, or until the solution has no acid taste, when the pulp will be ready for future experiment. If a portion of the pulp be viewed by a power of about 100 diameters, it will be seen to consist mostly of amylaceous precipitated matter, (amorphous,) void of organic structure, combined with partially-dissolved flax fibers. If it be ground with a glass spatula and viewed again it will be seen that the only change effected is the reduction of the size of the particles of flax, no starch-like bodies being observable; but if there now be added to it one drop of the tincture of iodine, one of muriatic and one of sulphuric acid, blue globular and starch-like bodies will be formed from the undissolved flax. That portion of the flax-fiber which was rendered soluble in the acids and precipitated on the addition of pure water, is amorphous cellulose, and remains structureless. If the pulp so treated be ground again with a spatula while combined with these solvent acids, a much greater variety of these globular bodies will appear. Rotation and a solvent solution are all that is necessary in this case to produce these artificial starch-like granules in abundance. It will be observed that these amylaceous granules are formed from two distinct causes. The first mentioned results from the expansion of the disks described, and the second from the action of the soluble acids, assisted by the rotation of the partially-dissolved flax particles.

The spiral cellulose vessels of the ovaries of the blossoms of fruit and tender leaves of the beech are stained purple and sometimes pale

Fig1.

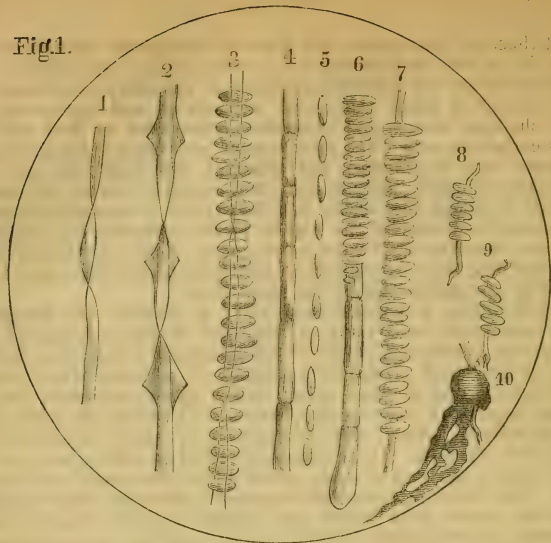
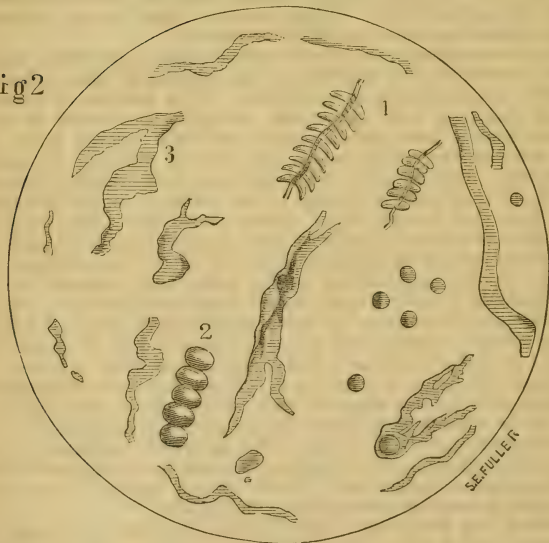


Fig2



Animal and vegetable cellulose and starch.

blue; but those of fruit-tubers and matured foliage are stained brown. The first is of the amylaceous, the second of the woody type. The larger proportion of the cellulose structure of the nutritious fruits, foliage, and grasses, is easily converted into starch and ultimately into sugar, by chemical means, and by animals when used as food, and are known as carbohydrates. The mycelium of microscopic fungi consists, for the most part, of cellulose, and although the fungi are very low forms of plant-life, they are not only the principal formers of some of the organic acids, as the acetic, but they grow to maturity in them; while the woody cellulose of the higher plants dissolves in the acetic ferments and becomes food for the cryptogams. Some varieties of mycelium take the blue stain by iodine and sulphuric acid, while other kinds are turned of an amber-color by the same tests.

When gun-cotton, a nitro-cellulose body, is treated very frequently with the iodine and acid tests, as described in the experiments with cotton and flax, it becomes yellow or amber-colored; and when the fine saw-dust of box-wood is similarly treated, it appears, when viewed under the microscope, of three colors, amber, green, and blue; but the latter color appears in very small quantities. Chitine, the cellulose of insects, is stained yellow, and is supposed by some chemists to be combined with nitrogen. Color cannot be relied on wholly as a test for cellulose, since it assumes so many colors under treatment with iodine and acid. The following colors are frequently observed when treating cellulose and starch with iodine and sulphuric acid: Purple, bluish-purple, green, yellow, amber, reddish-amber, pale-blue, deep-blue, and a translucent amylaceous white. When starch is acted on by sulphuric acid alone it dissolves and is partially carbonized.

In making investigations on animal tissues, viscera and blood, I have endeavored to ascertain the condition of the cellulose in them, whether it is tubular, membraeous, or amorphous. If a portion of brain is bruised and combined with iodine and the acids mentioned, so as to produce the boiling heat, amber, purple, and blue colored forms are frequently seen, particularly so when the brain of a herring is used in the experiment. Angular plates are always seen in the brain of the calf, and are without color until subjected to the action of iodine and suitable acids, when they become blue. These plates have been by some writers termed cholesterine, but there is no chemical authority that I can find which declares that cholesterine is turned blue by the cellulose and starch tests. In my experiments on the heart, liver, muscles, &c., of the higher animals, I never fail to detect structural cellulose in them. 8, 9, and 10 represent some of the forms found under chemical action; I, Fig. 2, is similar; 2 and 3 and the other form of this plate are produced from 1 by using extra acid, and sometimes by slight friction. In animal tissues and viscera a great variety of cellulose and tubular forms may be detected in various stages of color, which are not represented by the cuts. To be successful in these experiments a great deal of perseverance is necessary, as the animal cellulose is well protected by the other substances present, which frequently resist the tests applied until they are repeated several times. Fresh animal tissues, viscera, &c., should be used in making preliminary examinations.

Since writing the foregoing, I have made some new experiments on human arterial blood taken directly from an artery, and also on the mixed blood of a fowl. In each case well-defined amylaceous matter has been detected.

The fresh blood of a fowl was whisked with a fork to separate the fibrine from the liquid portion. The fibrine was next dissolved in dilute

caustic potash, to which was added acetic acid until the precipitate ceased to form; a portion of it will ultimately float on the top; remove a portion of it by means of a clean glass rod, and place it on a microscopic slide; add to it one drop of transparent solution of tincture of iodine, followed immediately by one drop of concentrated muriatic acid; then examine it carefully under a power of about 150 diameters, for starch, if it is present, will appear in granules of a blue or purple color. At this stage of the process these chemicals will not convert amylaceous cellulose into starch, even if present. To this same mixture add one drop of concentrated sulphuric acid; place a glass disk over the contents, and blue amylaceous matters in various forms will probably be found; but should there be an entire absence of blue color, and opaque brown particles appear, remove the disk and apply the chemicals again as before. Should too much sulphuric acid be employed the whole coloring mass will be dissolved. The amylaceous matter present at the same time appears, when superfluous sulphuric acid is used, in white translucent bodies, dissolving in streaks; but the proper admixture of iodine solution with muriatic and sulphuric acid will give the desired results. Many experiments will need to be made by microscopists before sufficient expertness and satisfactory results can be obtained. That portion of the blood which remains after the fibrine has been removed from it has been examined for starch granules, but none were found; when tested for amylaceous cellulose a trace of it appeared. I conclude, as a result of hundreds of experiments, that amylaceous cellulose is combined with the fibrine of the blood, arterial and venous, and may be detected in even a minute portion of it, in the manner described.

FACTS FROM VARIOUS SOURCES.

The Swartz system of butter-making.—The Department of Agriculture is indebted to the Secretary of State for a copy of a recent dispatch from the minister of the United States at Stockholm, Hon. C. C. Andrews, containing an interesting description of the process known as the Swartz system of butter-making in Sweden. This system has given to Swedish butter a high reputation in European markets, but is little understood, probably, in the United States. The dispatch, which contains also some additional facts concerning Swedish butter-making, is here given in full, as furnishing statements and hints which will be of interest and value to the dairy industry of this country:

Sir: The Swedish ice-water system of setting milk, now in general use in this country in butter-making, and known from the name of its inventor as the Swartz system, was described in 1872 in an article by Mr. C. Juhlin Dannfelt (now Swedish commissioner at the Centennial Exhibition) in the journal of the Royal Agricultural Society of England, which article was also published and circulated in pamphlet form. The system has been described more recently by Mr. H. M. Jenkins, Secretary of the Royal Agricultural Society of England, in his very full report on the agriculture of Sweden and Norway, which was published last year. From inquiries, however, which have lately come to me from the dairy region of the State of New York, it would seem that this system is not popularly understood in the United States, wherefore I beg in this dispatch to note its principal features.

The milk is placed, as soon as practicable, in iron or steel pail-shaped cans, which have been thoroughly tinned, inside and outside, and which have a diameter of eight or nine inches and a depth of twenty inches. These, having each a close-fitting cover of gauze, are set about a quarter of a foot apart, in ice-water of a temperature of 35° Fahrenheit. To obtain and preserve this low temperature the ice needs to be cut into pieces only two or three inches thick. The surface of the water is about on a level

with the surface of the milk. The cream rises in course of ten or twelve hours. It is churned sweet, and at a temperature, when beginning, of 58° to 62° Fahrenheit. This, in brief, is the ice-setting system; and its merits appear to be in the saving of time and in the maintaining the mastery over the cream in all temperatures.

In this connection, possibly a few additional facts as to Swedish butter-making will be of interest.

It is usual, at the factories, to add before churning some drops of a coloring-fluid, but of course the butter is in reality the worse for it; and I am sure that for family use here the preference is given to private dairy butter which has no artificial coloring. The churns in general use are barrel-shaped, placed vertically. In the factories the churns are of different sizes, say from thirty to one hundred gallons capacity, with a cylinder dasher, which has two vertical wings, and is moved by steam at the rate of about one hundred revolutions per minute. The butter is obtained on an average in about 45 minutes. It is worked by a machine which is an American invention, with, as is claimed, some Danish improvement. The mechanical working of butter is the only new feature which has been introduced into Swedish butter-making since the publication of Mr. Jublin Dannfelt's above-mentioned article. About 5 per cent. of salt is used for a distant market. The butter is packed in water-tight beech casks holding about one hundred pounds each. The practice now is not to use brine in preparing them, but merely to let them stand full of cold water twenty-four hours before receiving the butter. They are all new when used, and cost here at the rate of forty cents, gold, each.

Butter can be shipped from Stockholm to London, via Hull, in as short a period as four days, but actually it takes eight days and sometimes longer, because the steamers which take it from Gothenburg direct are generally four days at the London dock before the butter is delivered. The circular of Thomas Nesbitt & Co., of London, under date of the 3d instant, quotes American and Swedish butter at wholesale as follows: American fine, 26 cents (gold) to 27 cents per pound; Swedish extra, 33 cents to 34 cents per pound; and Swedish fine 30 cents to 32 cents per pound. There were no quotations of American extra.

The favorite stock of cows in Sweden is short-horns crossed with Ayreshire. But short-horns mixed with common stock are more frequently to be met with. There is also some Holland stock. In the best-managed dairies the yield of milk per cow will average about 700 gallons a season. It has been found that 2.65 gallons of milk yield .46 gallon of cream, which last yields one pound of butter. Also, that in the ice method of setting milk eighty-five pounds of ice are required for one hundred pounds of milk.

In 1874 Sweden exported 71,295 centner (of 94 pounds to a centner) of butter, of the value of 6,416,550 kronor—one kronor being equal to 26.80 cents in gold. This, taking the number of cows in Sweden at 1,340,000, was at the rate of five pounds per cow.

As a proof of the increasing interest in the dairy industry in Sweden, I would mention that two original works on that subject in Swedish have been published this present year. One, of which four thousand copies of the first edition were printed, is entitled, "*Några ord rörande Ladugårds-och Mjölk-hushållning*," (Some words on farm-yard and milk economy.) It is by Mr. P. Von Möller, a wealthy and cultivated landholder and member of the first chamber of the Rigsdag, and is considered a very excellent work. The other is by Professor Alfred Nathorst and entitled, "*How should the dairy be managed to be, under our circumstances, the most paying?*" This is, also, a good work.

It has been a saying among the Swedish peasantry that stock-raising and the dairy are necessary evils. In old times, however, these industries were rather extensively developed. Olaus Magnus, a Swedish historian, who wrote in the beginning of the sixteenth century, mentions in his work that cheeses were made in Sweden and exported, so large that two strong men could carry one of them only a short distance. He states, too, that they were made at "village dairies"—embryo factories—of milk brought in by the neighboring farmers' wives. An old and rare illustrated edition of his history in Latin contains a picture of two robust men in the act of carrying one of those cheeses.

GRAIN-RAISING IN SPAIN.—Don Perruelas, a member of the Spanish Cortes, in a late publication, shows that while Spain is the second among European countries in the proportion of farm-lands devoted to cereal culture, her actual product ranks only as the sixth. Great Britain averages 27½ bushels per acre, Netherlands 25¼, Belgium 20¾, Norway 12¾, and Spain 11½. Spain should at least excel Norway with her inhospitable climate and brief season of germination. The Spanish statesman attributes this remarkable result to the stolid listlessness of his countrymen. As long as an exhaustive system of culture will eke out

a common subsistence, no efforts will be made to aid the natural productiveness of the soil. Since 1851 there has been a gradually increasing deficit in home production of grain, which, in 1860, required an importation of 4,000,000 bushels of foreign grain, and in 1870 of nearly 20,000,000. Don Perruclas sees no remedy for this destructive drain upon the Spanish soil, except in a general reform of agricultural methods in impressing upon the agricultural classes the necessity of economizing the resources of the soil. To accomplish this, agricultural schools should be established; but the impoverished condition of the treasury forbids anything of the kind at present.

BET-SUGAR IN DELAWARE.—An association of gentlemen in the State of Delaware has been formed with the purpose of developing the capacities of that State for the culture of the sugar-beet and the manufacture of beet-sugar. They have imported seeds from France, England, and Saxony, and have distributed them among the best farmers of Delaware, the eastern shore of Maryland, and the southern part of New Jersey for experimental culture. The superintendent of Delaware College farm also devotes special attention to scientific experiments with these seeds. Circulars are sent to each experimenter with specific directions in regard to culture, harvesting, and preservation of the crop. This movement, it is hoped, will inaugurate, during the Centennial year of our Independence, a new and profitable industry in this section of our country. Within the last quarter century we have more than doubled the rate of consumption of sugar in the United States. In 1850 we averaged about 20½ pounds per capita of the population, and in 1874, 42¾ pounds. We are paying from \$80,000,000 to \$90,000,000 per annum for foreign sugar, a very considerable proportion of which might be saved by home production. This can be done only by intelligent efforts like the above to test the local capacity of different sections for the sugar-beet and by greater enterprise in the cane-sugar regions bordering on the Gulf of Mexico.

INDUSTRIES OF KENT COUNTY, MICHIGAN.—In 1873 this county raised 569,353 bushels of wheat on 41,932 acres, 564,902 bushels of corn on 19,186 acres, 503,433 bushels of other grain, 263,866 bushels of potatoes, 43,552 tons of hay, and 251,072 pounds of wool. Of produce marketed, there were 1,145,944 pounds of pork, 17,285 pounds of cheese, 961,868 pounds of butter, 18,951 pounds of dried fruit, 2,272 barrels of cider, and 299,509 pounds of maple-sugar. The county contains 27 flouring-mills, 3 of which use steam as a motive-power; these employ 85 persons and \$418,800 of invested capital, making, per annum, 159,350 barrels of flour, worth \$1,339,025. The live stock embraces 10,391 horses over a year old, 124 mules, 1,609 oxen, 11,587 milch cows, 10,955 cattle, 13,200 swine over six months' old, and 60,571 sheep. In the county are 54 saw-mills, employing 1,065 persons, with a capital of \$905,800, and turning out per annum 119,528,000 feet of lumber, worth \$1,466,500. From 21 shingle-mills, operated by 168 employes and employing \$45,000 of capital, an annual product of \$128,000 is reported. In 17 planing and turning mills, employing 351 hands and \$436,000 capital, \$560,000 worth of products are annually turned out; 9 foundries and machine-shops, employing 209 hands and \$212,700 capital, produce annually \$309,000; 5 agricultural-implement factories, 88 hands and \$162,000 capital, produce annually \$220,000. Including the foregoing, the county contains 215 manufactories, employing 4,230 hands and \$4,561,000 of capital, producing annually \$7,149,319. The prosperous condition of the farmers of this county shows the influence of a home market for their products.

DEPRESSED CONDITION OF ENGLISH FARMING.—The Mark Lane Express says that farmers are keeping down expenses by every possible method of economy, and that the number of farm-laborers out of employ exceeds that of any former season, at least for several years past. Many are preparing to give up their leases, and an unusual number of farms to let are advertised. The land-owners still contend for rates of rental out of all proportion to the profits of cultivation. The general opinion among British farmers is that land is worth far less for purposes of cultivation than it was twenty years ago. Judging from the past, the Express comes to the uncomfortable conclusion that nothing but a panic will bring down British farm rents. "They have generally come down with a run when they have been reduced at all, and the run has invariably been preceded by a stampede of tenants." Perhaps a sufficient appreciation of the situation is still practicable by British land-owners, leading them to meet the present demand for lower rents with a prudent if not gracious compliance. If farming enterprise is to be hampered with this heavy tax of capital in real estate, it will be compelled to yield to the active competition of other countries, and the agricultural interest of the United Kingdom will receive a severe check.

DESTRUCTION OF LOCUSTS.—The Spanish government, by the collapse of the Carlist rebellion, found itself with a large army. An invasion of locusts suggested the novel employment of the troops in their destruction. Soldiers were sent by thousands into the infested districts to dig trenches in the line of march of those pests, and as they fell in to cover them with earth or turn pigs into the trenches to devour them. The contest promises to be as tedious as the Carlist war.

FACTS IN BRITISH AGRICULTURE.—The following statistics are condensed from recently-published official reports in Great Britain for 1875.

Proportion of farms of different sizes.—The holdings, or farms occupied by individual cultivators, are reported in three classes. The first, including those under 50 acres, constituted 71 per cent. of the whole number in England, and 70 per cent. each in Wales and Scotland. The second, including those having not less than 50 and not over 300 acres, in England, 25 per cent.; Wales, 27; Scotland, 27. The third, including those having over 300 acres, in England, 4 per cent.; Wales, 1; Scotland, 3.

Relative extent of cultivation and production by the different classes of farmers.—Of the total acreage under crops, fallow, and grass in England, the small farmers, being 71 per cent. of the whole number, cultivated 15 per cent.; the medium farmers, 25 per cent. in number, cultivated 56 per cent.; the large farmers, 4 per cent. in number, cultivated 29 per cent. In Wales the 70 per cent. in the first class cultivated 23 per cent.; the 29 per cent. in the second class, 68 per cent.; the 1 per cent. in the third class, 9 per cent. In Scotland the 70 per cent. in the first class cultivated 14 per cent.; the 27 per cent. in the second class, 53 per cent.; the 3 per cent. in the third class, 28 per cent.

Of the horses used solely in agriculture, or still unbroken, in England the first class held 19 per cent.; the second, 57; the third, 24. In Wales the first class, 27 per cent.; the second, 67; the third, 6. In Scotland the first class, 26 per cent.; the second, 57; the third, 17.

Horses were on the increase, as they had been for several years. In Great Britain the chief increase had been "in the class of mares kept solely for breeding, and of unbroken horses. The number of this class in 1875 was 388,000 against 367,000 in 1874 and 314,000 in 1871, so that between 1871 and 1875 there has been an increase, chiefly young horses,

of 74,000, or 23 per cent." The number of horses imported in 1873 was 17,822; in 1874, 12,033; in the first ten months of 1875, 23,390. The exports were 2,816 in 1873, 3,050 in 1874, and 2,791 in the first ten months of 1875. The trade-returns for 1875 showed that the average value of English horses exported was \$385 per head, while that of those imported was only \$185 per head. The total number of horses in the United Kingdom was estimated 2,790,000, of which 526,000 were in Ireland.

Of the cattle of all descriptions in England the class of small farmers held 23 per cent.; the middle class, 57; the large farmers, 20. In Wales, the first class, 30 per cent.; the second, 65; the third, 5. In Scotland, the first class, 27 per cent.; the second, 57; the third, 16.

In Great Britain there was a slight decrease in the total number, chiefly of young stock, the reduction being ascribed to the effects of the dry summer and severe winter of 1874. The number of cows and heifers in milk was diminished by only 20,000, being 2,253,000 in 1875 and 2,273,000 in 1874. The decrease of cattle under two years of age amounted to 168,000. "In the chief beef-producing class of stock, that of cattle of two years of age and above, there was an increase, compared with 1874, of 76,000, the number in 1875 being 1,585,000." The imports of oxen and cows into the United Kingdom were larger in 1875 than in either of the two years preceding, numbering, for the first eleven months in 1875, 215,000; in 1874, 148,000; in 1873, 151,000. The total number of cattle of all ages in the United Kingdom was 10,162,787. Of these, 6,050,797 were on the smaller islands, and 4,111,990 in Ireland.

Of the total number of sheep in England, the class of farmers holding less than 50 acres each possessed 9 per cent.; the middle class, 51; the class of large farmers, 40; in Wales, the first class, 28 per cent.; the second, 63; the third, 9; in Scotland, the first class, 33 per cent.; the second, 44; the third, 23. The greater percentage of sheep on the small holdings in Wales and Scotland than in England, is accounted for by the fact that in these more hilly countries many of the small farmers hold tracts of rough pasture not returned in the area of "cultivated land." It is stated that a season which diminishes the supply of green food, especially grass, occasions greater proportionate reduction in the number of sheep than of cattle. Owing to the dry summer and severe winter of 1874, the total number of sheep and lambs in Great Britain was 1,146,000, or about 4 per cent. less in 1875 than in 1874; in Ireland the number was 189,000 less. The number imported into the United Kingdom was, in 1875, 938,000; in 1874, 721,000; in 1873, 812,000. The total number of sheep and lambs reported for 1875 was 33,491,948, of which 4,248,158 were in Ireland.

The total number of pigs in the United Kingdom was 3,495,167, of which 1,249,235 were in Ireland. In Great Britain there had been a decrease in the number in each of the last three years, which, in 1875, amounted to 193,000, while in Ireland there was an increase of 150,000.

The tables below give more specific statistics respecting the relative extent of different classes of crops and farm-animals.

Acres in crops.

	Years.	England.		Scotland.		Ireland.		Total for United Kingdom.	
		Acres.	Percent- age.	Acres.	Percent- age.	Acres.	Percent- age.	Acres.	Percent- age.
Total area of land and water .....	.....	32, 597, 398	.....	19, 496, 132	.....	20, 819, 886	.....	77, 828, 886	.....
Under all crops.....	1874	24, 003, 368	.....	4, 579, 821	.....	13, 752, 187	.....	47, 143, 320	.....
	1875	24, 112, 309	.....	4, 607, 898	.....	13, 774, 718	.....	47, 313, 789	.....
Corn-crops	1874	7, 505, 076	31.3	1, 410, 413	30.8	1, 901, 508	12.1	11, 364, 834	24.1
	1875	7, 522, 543	31.2	1, 410, 929	30.6	1, 916, 398	12.1	11, 392, 030	24.1
Green crops	1874	2, 764, 182	11.5	685, 132	15.0	1, 353, 362	8.6	4, 957, 683	10.5
	1875	2, 848, 473	11.8	684, 549	14.8	1, 370, 086	8.7	5, 057, 099	10.7
Bare fallow	1874	607, 489	2.5	20, 687	.4	12, 187	.1	673, 376	1.4
	1875	515, 186	2.1	16, 876	.4	11, 287	.1	570, 005	1.2
Grass and clover ..	1874	2, 618, 655	10.9	1, 357, 009	29.6	1, 906, 033	12.1	6, 284, 925	13.3
	1875	2, 602, 106	10.8	1, 385, 369	30.1	1, 943, 923	12.3	6, 337, 953	13.4
Permanent pasture	1874	10, 433, 149	43.5	1, 106, 321	24.2	10, 472, 161	66.5	23, 680, 416	50.2
	1875	10, 536, 283	43.7	1, 110, 025	24.1	10, 431, 776	66.1	23, 772, 602	50.2
In orchards	1875	150, 600	.....	1, 449	.....	.....	.....	.....	.....
In woods	1875	1, 325, 765	.....	734, 490	.....	325, 173	.....	.....	.....

Number of farm-animals.

	Years.	England.		Scotland.		Ireland.		Total for United Kingdom.	
		Acres.	No. to each 100 acres in crops.	Acres.	No. to each 100 acres in crops.	Acres.	No. to each 100 acres in crops.	Acres.	No. to each 100 acres in crops.
Total number of horses.....	1874	1, 007, 398	4.2	150, 818	3.9	525, 770	3.3	1, 847, 148	3.9
	1875	1, 031, 776	4.3	183, 642	4.0	526, 160	3.3	1, 875, 851	4.0
Number of cattle ..	1874	4, 305, 540	17.9	1, 154, 846	25.2	4, 118, 113	26.1	10, 251, 036	21.8
	1875	4, 212, 470	17.5	1, 143, 020	24.8	4, 111, 990	26.1	10, 162, 787	21.5
Number of sheep ..	1874	19, 859, 758	82.7	7, 389, 487	161.3	4, 437, 613	28.2	34, 837, 597	73.9
	1875	19, 114, 634	79.3	7, 100, 994	154.1	4, 212, 158	26.9	33, 491, 948	70.2
Number of pigs.....	1874	2, 052, 781	8.6	150, 297	3.3	1, 096, 494	7.0	3, 547, 354	7.5
	1875	1, 875, 357	7.8	151, 213	3.3	1, 249, 235	7.9	3, 495, 167	7.4

LAND-OWNERS AND LANDS IN ENGLAND.—Official returns for England and Wales, exclusive of the metropolis, make the total population 19,458,009; the number of land-owners owning less than 1 acre, 703,289; owning 1 acre or more, 269,547; total, 972,836. Extent of lands, 33,013,510 acres; estimated gross rental, \$496,761,515; estimated extent of commons or waste lands, 1,524,648 acres.

FRESH BEEF IN LONDON FROM THE UNITED STATES.—The Agricultural Gazette of February 21, 1876, in noticing the fact that on the previous Monday 70 tons of beef, in quarters, shipped from this country, arrived in London, in addition to about 300 tons arriving in January, states that "the possibility of landing dead meat in a sound and sweet condition, after a three weeks' voyage, has at length been clearly demonstrated." The successful arrangements for safe shipment are thus described: "Square compartments are formed in the hold of the vessel, outside of which tanks are placed. By these means the temperature of the atmosphere in which the meat hangs is kept down to something under 40°. To prevent condensation of vapor in this ice-bound tank, a constant current is kept up by a fan driven by steam from the boiler of the vessel." The newly-slaughtered meat, cut in quarters, each covered in cheap cotton cloth tightly sewed around it, is hung up in this safe,

the quarters not being permitted to touch one another. The writer states: "It is anticipated that an immense trade of this kind will be done before many years; and this, not only in the winter, but through the summer months. Arrangements are being made for increasing this traffic at an early date. The margin of prices is so great that efforts will be made to get the White Star and Cunard lines of steamers to take in a meat-safe and ice-tanks, by which means consignments may be made almost every day of the week. What has arrived has been brought by the Guion steamers. Viewing this matter commercially, there is ample room for expanding this trade. The average weight of meat sent to the metropolitan market during the last seven years has been 500 tons per day."

A later paragraph announces the arrival, in good condition, by the White Star line, of 650 quarters, weighing about 60 tons.

IMPROVED METHOD IN WHEAT CULTURE.—The following communication is addressed to the Commissioner of this Department by Mr. John M. Heiges, of York, York County, Pennsylvania, under date of May 20, 1876.

In reply to yours of the 17th instant, requesting me to give you an article on the "principle" I have adopted in wheat culture, and its results, I would say: I commenced farming about eight years ago. My success in raising wheat was not very satisfactory, and as I did not believe in seeding with the drill, I scored my ground with shovel-plow, sowed broadcast, and harrowed in. I thought my wheat looked much better than adjoining fields sown with the drill; still, not being satisfied, and believing that I could not raise a crop of corn or potatoes without cultivating, I asked myself this question, Would it not pay to cultivate wheat the same as corn? In the summer of 1872 I manured about three acres of ground, plowed it down about the 10th of August, and let it lie until about the 20th of September, when I plowed it the second time and harrowed well. I then measured off a sixth of an acre, and used a common hoe to make scores about five inches wide, and as nearly level on the bottom as they could be made. I left a space of about six inches wide between the scores. I sowed on said plot 8 quarts of Fultz wheat on the 25th of September, and raked it in. In the spring of 1873, I hoed the spaces between the wheat once in April and once the first week of May. Sowed to clover after the last hoeing, and had a fine crop of clover. When the wheat came into heads, I found them much larger than those of the same variety sowed the same day on adjoining ground of the same kind of soil, and the whole treated alike as to manuring and plowing. I harvested and thrashed from the plot a little over 8 bushels, or nearly double the amount per acre produced on the remainder of the field. I always plow twice for wheat and very deep.

In the fall of 1873 I sowed all my wheat on the same principle, but making my scores (with a double mold-board cultivator) about 8 inches wide, and the ridges about 10 inches wide, sowed broadcast and harrowed lengthwise once, then dragged to level the ground. In the spring of 1874 I cultivated a plot of one acre. I hoed part of the plot once, part twice, and the remainder three times. On the part hoed once the heads were about one-eighth larger than where I did not hoe; on the part hoed twice they were still larger; and on the plot hoed three times they were larger yet, some of them measuring nearly 6 inches in length, and satisfying me that it pays to hoe three times. The yield from the plot cultivated was 55 bushels per acre: from the remainder of the field about 23 bushels per acre. Of course I did not sow the plot I hoed to grass. The remainder of the field was sowed with timothy and clover.

In the fall of 1874 I again put my crop in on the same principle. Some of it I left without spring cultivation. I found that the heads of that which I did not cultivate were larger than the heads of the same variety put in with the drill, but not anything in comparison with the heads on the ground which I cultivated. I have a lot of ground containing 20 square yards—less than the third of an acre—on which I sowed 15 quarts of a new variety of wheat, which I had made by cross-fertilization, using as the parents Arnold's hybrid No. 9 and Fultz; the former being a white wheat, stiff straw, and the latter a red wheat. The yield from that lot was 16½ bushels, or about 49½ bushels per acre. Gave it only one hoeing in the spring of 1875. In the fall of 1874 I procured 1 pound of seed of a wheat imported from one of the German States, some person having brought it with him from Germany. I paid for the pound \$1, and sowed it on the fifty-sixth part of an acre. I hoed it once in April, again on the 3d of June, and cut and thrashed from the product 1 bushel and 9½ quarts, or at the rate of 71 bushels per acre. I had the plot measured by two of the managers and in the presence of the president and secretary of the York County Agricultural Society. I have

now about six acres of wheat growing, put out in the same way, except that last fall I made the scores 12 inches wide, left the spaces for cultivating 10 inches wide, thereby utilizing more ground than heretofore, and using the same space for cultivation. My wheat this summer looks much better than any former year at this time. I am well satisfied that the advantages are, more space occupied, a freer circulation of air, opening up the soil to air and warmth when the plant seems to need such influences, the growing of the wheat in larger masses, so that it is more difficult for the frost to uproot it, and the better setting of the plant if lifted by the frost. It also seems to me that it protects itself better than when sowed with the drill. You can form a much more correct idea of it when you see the wheat growing. As I said before, I sow broadcast, and harrow lengthwise, and nearly all that falls on the ridges rolls down into the scores by harrowing.

The extra cost of putting in wheat in this way, and of cultivating it, over the cost of drilling, I do not think would reach \$3 per acre, though I have not kept an accurate account.

I have now given you, as nearly as I can, on paper, the principle and results of my experiments in wheat-culture for the last few years. These experiments have convinced me that the new method is more successful in insuring a crop than any other.

A FATAL WORM.—A correspondent in Wilson County, Texas, reports that 10 per cent. of the colts and lambs have been lost through injuries from a "screw-worm," which has infested them throughout the winter.

HARD FROST.—Our correspondent in Powhatan County, Virginia, reports that on the night of April 30 a severe frost killed all apples, peaches, and other fruit, and did much injury to garden-vegetables.

WHEAT FROM THE UNITED STATES IN RUSSIA.—In 1875, in response to a request from Mr. Louis Walkoff, a large agriculturist at Kiev, South Russia, this department sent to him, for trial, samples of Tappahannock, Jennings, Faltz, and Clawson wheat. Under date of April 29, 1876, he reports that these wheats, drilled in on the 3d of September, were all frozen out during the winter. The maximum of cold was 26½° Fahrenheit below zero, under which the Poland wheat grown in that climate stood the winter very well.

ONIONS IN EPIZOOTIC INFLUENZA.—S. R. Mason, of Purple Cane, Dodge County, Nebr., under date of May 16, writes:

When the epizootic influenza first made its appearance in the East, some three years ago, and long before it reached us, as a means of prevention I gave each beast a pint of small onion sets daily in the feed-boxes with their corn. Almost every horse and mule in the State had the disease badly, and all that were in a weak condition when attacked died. My team not only escaped but was in excellent condition all the time, doing all my own work, besides much hauling for my neighbors, whose teams were disabled. Since then, I see by the papers that others have tried the onions with complete success, preventing attack and curing the diseased.

My team never touched the corn till they had eaten the onions. All kinds of stock require a variety of food; and roots, such as onions, beets, mangels, carrots, parsnips, turnips, &c., are relished by them, as well as wholesome, the year round. I never had an animal sick, and I ascribe their uniform good health to a frequent use of green vegetables. For convenience I keep the root-stock in accessible pits during winter.

IS THE POTATO-BUG LARVA POISONOUS?—Dr. S. J. Parker, of Ithaca, N. Y., communicates the following facts as an answer to this question.

I can respond in the affirmative in a few decided instances. Mrs. B—, residing five miles northeasterly from me, picked, when they first appeared, the larva off the vines with her hands. They became sore, especially between the fingers and on their backs, which skin disease was very intractable and months in healing. Many in the vicinity, also, state temporary injuries to the skin of the hands, as about the nails, between the fingers, and that old scratches and scars become inflamed. A gentleman of leisure, who is farming, has often remarked, "they ought to be good for medicine, for they blister well." Yet my impression is that they may be crushed with great impunity by most people on the bare skin if soon washed off.

But the most serious cases occurred not quite a year ago. An Irishman, residing a few miles off, allowed the larva to get into his boots, and hoed most of the day with crushed larva and bugs next his sweaty flesh. The result was not a blistering, in the

usual sense of the word, but a peculiar pus-formation beneath the outer layer of the skin. If any reader ever saw a post-mortem of a case of sudden, violent headache, excruciating in its agony, terminating in about two days in death, and on opening the skull has seen the waved lines of pus just under the covering of the brain, he has seen the form of the blistering of the potato-bug. It is that beneath a fiery red skin there appears irregular waved lines, about a sixteenth to an eighth of an inch wide, of pus or matter, which connect with each other. A marbled surface, congested, and with so much purulent matter that it seems as if by pricking it with a lancet a large quantity of pus would escape; but on using the lancet, even by dozens of cuts, but little of the yellow or greenish pus escapes. This man was six weeks in recovering.

The next case was also an Irishman. He was predisposed to gout and gouty rheumatism. When I was called to see him he had the pus-mark of the potato-bug, that is, the moss-like, or plant-like wavy lines of green and yellow pus on both feet and ankles; one leg up to the knee. I immediately asked for exposure to potato-bug; he denied any; but his daughter brought a pair of old shoes full of holes, and without strings, which were covered on their inside with the crushed wings of the Colorado potato-beetle. Then he said, "I never paid any attention to the bugs; did not know they could do any harm." He had worked three days with his feet wet with the juice of the beetles and larva, and his filthy old stockings stained with them, and not washed his feet at night. He lingered over two months and died in consequence.

The symptoms of the poisoning are burning, or "blistering heat," pain, restless oppression in the part, and the peculiar moss-like lines of slight deposit of pus in a mottled red, blackish skin. In the severe cases only constant application of ice or cold water gives ease; and, in the cases of my two Irishmen, even opiates gave but imperfect sleep.

The cuticle does not tend to break until a glove-like separation of the cuticle takes place quite imperfectly, and this with but little relief to the distress in severe cases.

I have seen but one case of breathing the fumes of hot water in scalding to death the bugs recently deposited. That had the red, angry appearance as if commencing scarlet fever, (in the throat,) with a choking sensation. It was intractable to any ordinary remedies either regular or homeopathic.

Hence, I conclude that while thousands work in potatoes infected with Colorado beetles and their larva and kill these insects, without danger, yet there is danger of a peculiar, intractable poisoning, attended with a pus formation not unlike that of certain forms of arachnidites. And, therefore, those liable to scrofulous and skin diseases and to throat diseases should use caution.

Probably many are poisoned who do not know it, and, as has been in trichina and other diseases, die, and the cause of disease is not recognized either by themselves or their physicians. Had I not seen the first Irishman, I certainly had not found out that the second died of potato-bug poison.

MOTIVE POWER OF ANIMALS.—In a paper recently read before the French society for the advancement of science, M. Marey showed that animals employed as motors exercised their power by jerks, so that commonly there was a waste of labor. He recommended the use of elastic material, such as India rubber, in carriage-traces, &c., in order to equalize and economize the power of the animal. In towing canal-boats by aid of long ropes, the tightening and slacking of the rope, and its oscillating movement, contribute to the desired elasticity of draught.

MARKET-PRICES OF FARM-PRODUCTS

MAY AND JUNE, 1876.

The following quotations represent, as nearly as practicable, the state of the market at the opening of each month.

Articles.	May.	June.
NEW YORK.		
Flour, superfine State and western.. per barrel..	\$4 10 to \$4 50	\$4 00 to \$4 90
extra State.....do.....	4 90 to 5 50	4 90 to 7 00
extra to choice western.....do.....	4 90 to 9 00	4 90 to 9 00
common to choice southern, shipping extras.....per barrel..	5 00 to 6 25	4 90 to 6 15
common to choice southern, family brand.....per barrel..	6 25 to 8 75	6 15 to 9 00
Wheat, No. 1 spring.....per bushel..	1 26 to 1 30	1 28 to 1 30
No. 2 spring.....do.....	1 18 to 1 22	1 16 to 1 22
winter, red, western.....do.....	1 05 to 1 50	1 13 to 1 40
winter, amber, western.....do.....	1 05 to 1 50	1 13 to 1 40
winter, white, western.....do.....	1 32 to 1 45	1 35 to 1 50
Corn.....do.....	60½ to 61½	40 to 59½
Oats.....do.....	41 to 53	32 to 47
Rye.....do.....	80 to 95	85 to 96
Barley.....do.....	Nominal	Nominal
Hay, baled, first quality, for retail... per ton..	20 00 to 22 00	17 00 to 20 00
baled, second quality for shipping..do....	15 00 to 16 00	16 00 to ———
Beef, mess.....per barrel..	12 00 to 12 50	11 00 to ———
extra mess.....do.....	13 00 to ———	12 00 to ———
Pork, mess.....do.....	21 45 to 21 70	18 80 to 19 25
extra mess.....do.....	17 50 to ———	——— to ———
prime mess.....do.....	Nominal	——— to ———
Lard.....per pound..	13 to 13½	10½ to 11½
Butter, western.....do.....	22 to 32	16 to 25
State dairy.....do.....	25 to 32	19 to 27
Cheese, State factory.....do.....	6 to 13	8 to 11½
western factory.....do.....	3 to 12½	8½ to 10½
Sugar, fair to prime refining.....do.....	7½ to 7¾	7 to 8
Cotton, ordinary to good ordinary.....do.....	9½ to 10½	8½ to 10½
low middling to good middli'g..do.....	11½ to 12½	11 to 12½
Tobacco, lugs.....do.....	4½ to 7	6 to 8
leaf.....do.....	7 to 10½	8 to 10
Wool, American XXX and picklock...do.....	45 to 55	46 to 48
American XX and X.....do.....	38 to 46	38 to 44
American combing.....do.....	48 to 57	48 to 58
pulled.....do.....	25 to 42	25 to 40
California, spring clip.....do.....	21 to 30	19 to 25
California, fall clip.....do.....	16 to 23	12½ to 16
BOSTON.		
Flour, western superfine, spring... per barrel..	4 00 to 4 25	3 50 to 4 00
common spring extras.....do.....	4 50 to 5 00	4 25 to 5 00
good to fancy n'hwes't'n spring..do.....	5 00 to 9 50	5 00 to 9 25
good to fancy western winter...do.....	6 00 to 9 00	6 00 to 9 00
southern family.....do.....	6 50 to 9 00	7 00 to 9 00
Wheat.....per bushel..	1 05 to 1 60	1 10 to 1 60
Corn.....do.....	62 to 65	61½ to 65½
Oats.....do.....	42 to 52	42 to 56
Rye.....do.....	90 to 92	85 to 87½
Barley.....do.....	85 to 1 20	85 to 1 20
Hay, eastern and northern.....per ton..	15 00 to 21 00	16 00 to 23 00

Market-prices of farm-products—Continued.

Articles.	May.		June.	
BOSTON—Continued.				
Beef, mess	\$12 00	to	\$11 50	to
extra mess.....do.....	13 50	to	13 00	to
family	15 50	to	15 00	to \$16 00
Pork, prime	19 00	to	17 50	to 18 00
mess	22 50	to	21 00	to 21 50
Lard	14	to	13 $\frac{1}{4}$	to 13 $\frac{1}{4}$
Butter, New York and Vermont	27	to	22	to 25
western	18	to	17	to 24
Cheese, New York and Vermont factory	9	to	8	to 12
western factory	8	to	7	to 11 $\frac{1}{4}$
Sugar, fair to good refining	7 $\frac{1}{2}$	to	7 $\frac{3}{8}$	to 7 $\frac{7}{8}$
Cotton, ordinary to good ordinary	9 $\frac{1}{4}$	to	8 $\frac{3}{8}$	to 10 $\frac{1}{4}$
low middling to good middling	12 $\frac{1}{2}$	to	10 $\frac{1}{4}$	to 13
Wool, Ohio and Pennsylvania	37	to	36	to 45
Michigan	33	to	32	to 36
other western	32	to	32	to 35
pulled	18	to	15	to 40
combing fleece	47	to	45	to 47
California	14	to	14	to 23
PHILADELPHIA.				
Flour, superfine	3 50	to	3 25	to 4 00
Pennsylvania extra to choice	4 25	to	4 25	to 6 75
western extra to choice	5 25	to	5 25	to 8 25
Wheat, white	1 50	to	1 45	to 1 55
amber	1 50	to	1 40	to 1 48
red		to	1 15	to 1 43
Rye	1 25	to	80	to 85
Barley		to	Nominal.	
Corn	60	to	57	to 59
Oats	42	to	34	to 43
Hay, baled, prime	21 00	to	19 00	to 20 00
common to fair shipping	19 00	to	17 00	to 19 00
Beef, western mess	9 00	to	6 00	to 8 00
extra mess	11 50	to	10 50	to 11 00
Warthman's city family	16 00	to	14 50	to 15 00
Pork, mess	22 50	to	20 50	to
prime mess	18 50	to	18 00	to
prime (extra)	18 50	to	17 00	to
Lard	13	to	11 $\frac{1}{4}$	to 16 $\frac{1}{2}$
Butter, choice Middle States	30	to	24	to 26
choice western	26	to	18	to 20
Cheese, New York factory	5	to	5	to 13 $\frac{1}{2}$
Ohio factory	4	to	4	to 12
Sugar, fair to good refining	7 $\frac{1}{2}$	to	7 $\frac{3}{8}$	to 7 $\frac{7}{8}$
Cotton, ordinary to good ordinary	9 $\frac{3}{8}$	to	8 $\frac{1}{4}$	to 10 $\frac{1}{2}$
low middling to good middling	12 $\frac{1}{2}$	to	11 $\frac{1}{2}$	to 13
Wool, Ohio and Pennsylvania X to XXX	28	to	28	to 42
other western	35	to	30	to 36
pulled	22	to	22	to 36
combing fleece	37	to	40	to 55
tub-washed	40	to	30	to 45
BALTIMORE.				
Flour, superfine	3 50	to	3 50	to 4 50
extra	4 75	to	4 75	to 6 25
family	5 75	to	5 75	to 8 75
Wheat, red	1 20	to	1 10	to 1 37
amber	1 52	to	1 40	to 1 45
white	1 40	to	1 20	to 1 35

Market-prices of farm-products—Continued.

Articles.	May.	June.
BALTIMORE—Continued.		
Rye..... per bushel..	\$0 73 to \$0 75	\$0 75 to \$0 80
Oats..... do.....	39 to 48	34 to 42
Corn..... do.....	53½ to 62	53 to 57
Hay, Maryland and Pennsylvania... per ton..	21 00 to 26 00	22 00 to 23 00
western..... do.....	20 00 to 23 00	15 00 to 19 00
Pork, mess..... per barrel..	22 25 to 22 50	20 00 to —
prime..... do.....	21 25 to —	19 00 to —
extra prime..... do.....	18 50 to —	18 00 to —
Lard..... per pound..	13½ to 14	12½ to 13
Butter, western..... do.....	— to —	13 to 20
eastern..... do.....	22 to 30	13 to 20
Cheese, western factory..... do.....	11 to 13	11 to 12
eastern factory..... do.....	12½ to 14½	10 to 11½
Sugar, fair to good refining..... do.....	7½ to 7½	7½ to 7½
New Orleans grocery grades..... do.....	None.	— to —
Tobacco, lugs..... do.....	6½ to 9	6½ to 11
leaf, common to medium..... do.....	9 to 11	9 to 11
Cotton, ordinary to good ordinary..... do.....	8½ to 10	8 to 9½
low middling to good middling..... do.....	11½ to 12½	10 to 11½
CINCINNATI.		
Flour, superfine..... per barrel..	3 50 to 3 90	3 50 to 3 75
extra..... do.....	4 25 to 4 65	4 25 to 4 65
family and fancy..... do.....	6 50 to 7 75	6 25 to 8 50
Wheat, winter, red..... per bushel..	70 to 1 30	1 15 to 1 30
hill, (amber)..... do.....	1 25 to 1 30	— to 1 35
white..... do.....	1 35 to 1 45	1 30 to 1 40
Oats..... do.....	35 to 43	32 to 34
Corn..... do.....	45 to 51	38 to 47
Rye..... do.....	70 to 75	65 to 73
Barley..... do.....	30 to 94	Nominal.
Hay, baled, No. 1..... per ton..	15 00 to 18 00	16 00 to 18 00
lower grades..... do.....	7 00 to 10 00	7 00 to 10 00
Pork, mess..... per barrel..	20 50 to 21 50	18 50 to —
Lard..... per pound..	12 to 13½	10½ to 12½
Butter, choice..... do.....	25 to 28	18 to 20
prime..... do.....	20 to 23	16 to 18
Cheese, prime to choice..... do.....	12 to 12½	9 to 10
Sugar, New Orleans, fair to good..... do.....	8½ to 8½	8½ to 9
prime..... do.....	8½ to 9	9 to 9½
Tobacco, lugs..... do.....	— to —	— to —
leaf..... do.....	— to —	— to —
Cotton, ordinary to good ordinary..... do.....	8½ to 9½	07½ to 9
low middling to good middling..... do.....	11 to 12½	10½ to 12
Wool, fleece, common to fine..... do.....	35 to 40	30 to 35
tub-washed..... do.....	38 to 42	32 to 37
unwashed, clothing..... do.....	25 to 37	22 to 23
combing..... do.....	30 to 35	27 to 32
pulled..... do.....	28 to 30	26 to 27
CHICAGO.		
Flour, choice winter extras..... per barrel..	7 30 to 7 80	7 37½ to 7 87½
common to good winter extras..... do.....	5 80 to 7 10	5 87½ to 7 25
spring extras, common to good..... do.....	4 30 to 5 10	4 50 to 5 00
spring extras, choice..... do.....	5 10 to 5 60	5 50 to 5 87½
patent spring..... do.....	6 00 to 9 00	6 00 to 9 00
spring superfines..... do.....	3 00 to 3 75	3 00 to 4 00
Wheat, No. 1 spring..... per bushel..	1 12½ to —	1 04½ to 1 11
No. 2 spring..... do.....	98 to 99½	1 02½ to 1 03½
No. 3 spring..... do.....	90 to 90½	91½ to 92½

Market-prices of farm-products—Continued.

Articles.	May.	June.
CHICAGO—Continued.		
Rye, No. 2.....per bushel..	\$0 62 to —	\$0 68 to \$0 68½
Barley, No. 2.....do.....	62½ to \$0 63	55 to —
Corn No. 2.....do.....	45½ to 46	44½ to 45
Oats, No. 2.....do.....	30½ to 30½	28½ to 28½
Hay, timothy.....per ton..	12 00 to 14 00	10 50 to 13 00
prairie.....do.....	9 00 to 11 00	9 00 to —
Beef, mess.....per barrel..	10 75 to —	10 75 to 11 00
extra mess.....do.....	11 50 to 11 75	11 75 to 12 00
Pork, mess.....do.....	20 45 to 20 60	17 80 to 17 90
prime mess.....do.....	20 00 to —	— to —
extra prime.....do.....	16 00 to —	13 00 to —
Lard.....per pound..	12½ to 13	10½ to 11½
Butter, choice to fancy.....do.....	30 to 35	19 to 24
medium to good.....do.....	25 to 28	15 to 18
Cheese, good to choice factory.....do.....	9 to 11	9 to 9½
Sugar, New Orleans.....do.....	7¾ to 8¾	— to —
Wool, tub-washed.....do.....	44 to 50	35 to 41
fleece-washed.....do.....	38 to 42	30 to 33
unwashed.....do.....	23 to 28	18 to 24
pulled.....do.....	30 to 37	— to —
SAINT LOUIS.		
Flour, winter, common to choice.....per barrel..	3 50 to 7 00	3 50 to 6 50
spring.....do.....	— to —	— to —
Wheat, white winter.....per bushel..	1 00 to 1 40	1 10 to 1 40
red winter.....do.....	88 to 1 43	86 to 1 40
spring.....do.....	— to —	— to —
Corn.....do.....	41 to 50	39 to 44½
Rye.....do.....	50 to 68	50 to 63
Barley, fair to choice.....do.....	70 to 1 00	70 to 1 00
Oats.....do.....	31 to 38	30 to 37
Hay, timothy.....per ton..	17 25 to 17 50	15 00 to 19 00
prairie.....do.....	9 25 to 9 75	8 00 to 8 50
Beef, mess.....per barrel..	14 00 to 15 50	14 00 to 14 50
Pork, mess.....do.....	23 00 to 23 50	23 00 to 23 50
Lard.....per pound..	11½ to 13¾	11½ to 13¾
Butter, prime to choice dairy.....do.....	25 to 26	18 to 20
country packed.....do.....	22 to 25	13 to 16
Cheese, Ohio factory.....do.....	12½ to 13½	12½ to 13½
New York factory.....do.....	13 to 14	13 to 14
Wool, tub-washed.....do.....	42 to 45	35 to 37
fleece-washed.....do.....	38 to 40	36 to 37
unwashed.....do.....	26 to 27	26 to 27
NEW ORLEANS.		
Flour, superfine.....per barrel..	3 75 to —	3 75 to —
extra.....do.....	4 25 to 5 25	4 00 to 5 25
choice to fancy.....do.....	5 50 to 7 50	5 50 to 7 25
Corn, white and yellow.....per bushel..	57 to 68	63 to 70
Oats.....do.....	32 to 44	40 to 43
Hay, choice.....per ton..	22 00 to 23 00	23 00 to 25 00
prime.....do.....	17 00 to —	21 00 to —
Beef, Kansas.....per barrel..	— to —	— to —
Texas.....do.....	12 00 to 12 50	12 00 to 12 50
western.....do.....	15 00 to 15 50	14 00 to 15 50
Fulton market.....per half barrel..	11 75 to 12 00	11 75 to 12 00
Pork, mess.....per barrel..	22 00 to 22 75	22 50 to 22 75
Lard.....per pound..	13½ to 14¾	13 to 14½
Butter, choice Goshen.....do.....	42 to 44	33 to 35
choice western.....do.....	25 to 33	28 to 30

Market-prices of farm-products—Continued.

Articles.	May.	June.
NEW ORLEANS—Continued.		
Cheese, choice western factory....per pound..	\$0 13 to \$0 13½	\$0 12½ to \$0 13
New York cream.....do.....	15½ to 16	15 to 16
Sugar, fair to fully fair.....do.....	7½ to 8½	7½ to 8½
prime to strictly prime.....do.....	8½ to 9	8½ to 9
clarified, white and yellow.....do.....	9½ to 10½	9½ to 10½
Cotton, ordinary to good ordinary.....do.....	8 to 9½	7½ to 9½
low middling to good middling.....do.....	10½ to 13½	10½ to 12½
Tobacco, lugs.....do.....	5 to 7	5½ to 7½
low leaf to medium leaf.....do.....	7½ to 10½	8½ to 11½
SAN FRANCISCO.		
Flour, superfine.....per barrel..	4 25 to 4 50	4 00 to 4 50
extra.....do.....	4 75 to 5 25	4 50 to 5 75
family and fancy.....do.....	5 50 to 6 50	6 00 to 6 25
Wheat, California.....per cental..	1 50 to 1 90	1 50 to 1 75
Oregon.....do.....	1 75 to 1 85	1 60 to 1 72½
Barley.....do.....	1 10 to 1 25	1 00 to 1 20
Oats.....do.....	2 00 to 2 50	2 25 to 2 50
Corn.....do.....	1 05 to 1 15	1 05 to 1 15
Hay, State.....per ton..	12 00 to 19 00	9 00 to 15 00
Pork, mess.....per barrel..	22 00 to 24 00	22 00 to 24 00
prime mess.....do.....	17 50 to 18 50	17 50 to 18 50
Beef, mess.....do.....	8 50 to 10 00	9 50 to 10 00
family mess.....per half-barrel..	8 50 to 10 00	8 50 to 10 00
Lard.....per pound..	13 to 15	13 to 15
Butter, overland.....do.....	16 to 18	16 to 18
California.....do.....	25 to 30	25 to 30
Oregon.....do.....	20 to 22½	20 to 22½
Cheese.....do.....	12½ to 15	12½ to 15
Wool, native.....do.....	10 to 15	9 to 12½
California.....do.....	15 to 18	15 to 18
Oregon.....do.....	16 to 18	15 to 18

LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves.....per cental..	\$11 25 to \$12 00	to
good to prime.....do.....	10 00 to 11 00	\$9 75 to \$10 75
common to fair.....do.....	8 00 to 9 75	8 00 to 9 50
Texas.....do.....	8 00 to 9 00	8 00 to 9 00
milch-cows.....per head..	50 00 to 80 00	to
veal calves.....per cental..	4 50 to 7 00	3 50 to 7 00
Sheep.....do.....	6 50 to 8 50	4 50 to 7 50
Swine.....do.....	None in market.	6 90 to 7 00
PHILADELPHIA.		
Cattle, prime beeves.....per cental..	6 75 to 7 00	6 00 to 6 50
fair to good.....do.....	6 00 to 6 50	5 00 to 5 75
common.....do.....	5 00 to 5 25	4 00 to 4 75
Sheep.....do.....	4 00 to 7 75	4 00 to 6 75
Swine, corn-fed.....do.....	11 00 to 12 25	10 00 to 10 50
BALTIMORE.		
Cattle, best beeves.....per cental..	5 50 to 6 25	4 75 to 5 75
first quality.....do.....	5 00 to 5 50	4 37 to 4 75
medium or good quality.....do.....	4 50 to 5 00	4 00 to 4 37
ordinary.....do.....	4 00 to 4 25	3 50 to 4 00

Live-stock markets—Continued.

Articles.	May.		June.	
BALTIMORE—Continued.				
Cattle, general average of the market. pr. cental	\$5 50	to	\$5 00	to
most of the sales. do.	5 00	to	\$6 00	4 37 to \$5 25
milch-cows. per head.		to		to
Sheep. per cental.	2 75	to	6 00	4 00 to 5 75
Swine. do.	9 75	to	11 00	8 50 to 9 25
CINCINNATI.				
Cattle, good to prime butchers'				
steers. per cental.	4 75	to	5 25	4 25 to 5 00
fair to medium. do.	3 75	to	4 50	3 50 to 4 25
common. do.	2 75	to	3 50	2 50 to 3 25
milch-cows. per head.		to		to
veal calves. per cental.		to		to
Sheep. do.	4 60	to	7 60	3 50 to 5 00
Swine. do.	6 00	to	7 35	5 25 to 6 00
CHICAGO.				
Cattle, extra-graded steers. per cental.		to		to
choice beeves. do.		to	5 30	4 75 to 5 00
good beeves. do.	4 10	to		4 40 to 4 65
medium. do.	3 50	to	4 00	4 25 to 4 65
inferior natives. do.	2 50	to	3 75	2 50 to 4 15
Texas. do.		to		to
Sheep. do.	4 00	to	6 35	3 00 to 5 50
Swine. do.	7 25	to	7 65	5 80 to 6 35
SAINT LOUIS.				
Cattle, good to choice native steers. per cental.	4 20	to	4 50	4 45 to 4 50
common to fair natives. do.	3 25	to	4 05	3 25 to 4 25
inferior to common natives. do.	2 00	to	3 25	2 00 to 3 25
Texas, fair to choice. do.	3 00	to	3 50	3 00 to 4 00
Sheep. do.	2 75	to	5 25	3 75 to 5 25
Swine. do.	7 20	to	7 55	5 40 to 5 90
Horses, plugs. per head.	30 00	to	50 00	30 00 to 35 00
plain. do.	60 00	to	75 00	45 00 to 55 00
street-car. do.	75 00	to	125 00	75 00 to 125 00
heavy draught. do.	115 00	to	125 00	115 00 to 125 00
good drivers. do.	100 00	to	150 00	175 00 to 225 00
extra. do.	175 00	to	200 00	125 00 to 250 00
anction horses and ponies. do.	25 00	to	45 00	25 00 to 45 00
Mules, 14 to 15 hands high. do.	80 00	to	120 00	85 00 to 120 00
15 to 16 hands high. do.	115 00	to	130 00	115 00 to 150 00
extra. do.	160 00	to	170 00	175 00 to 185 00
NEW ORLEANS.				
Cattle, Texas beeves, choice. per head.	40 00	to		40 00 to
first quality. do.	35 00	to		35 00 to
second quality. do.	30 00	to		30 00 to
western beeves. per cental.	4 50	to	5 50	4 50 to 5 50
milch-cows. per head.	40 00	to	90 00	40 00 to 90 00
Sheep. do.	2 00	to	6 00	2 00 to 6 00
Swine. per cental.	6 00	to	8 50	6 00 to 8 50
Horses, good condition. per head.		to		150 00 to 200 00
plugs. do.		to		100 00 to 150 00
common. do.		to		40 00 to 80 00
Mules, well broken, first-class. do.		to		225 00 to 275 00
second class. do.		to		175 00 to 225 00

FOREIGN MARKETS.

WHEAT.—In the British isles the spring temperature up to the middle of May was very unfavorable to vegetation and discouraging to farmers. Night-frosts have been injurious to the more delicate grains, and have retarded, if they have not seriously injured, the hardier wheat-crop. The continued pressure of these abnormal conditions of growth caused general apprehension in regard to the outcome of growing crops. The light lands still promised fair crops, but the cereals on heavy soils by no means indicated a high or even average condition. Wheat looked sickly and yellow, and the growth in many cases was irregular and "patchy." Perhaps the speedy approach of warm spring weather would entirely change this prospect, but the period within which such an improvement is possible was rapidly narrowing, and the public mind was becoming more anxious as the unfavorable weather was protracted. The country-markets expressed this anxiety by a universal rise in the value of all unsold stocks of grain. The trade of the metropolis was firm, with a steady demand for the continent. Wheat during the week had advanced 1s. per quarter. The steadiness of this demand for export indicated a new cause for anxiety in a deficiency in regions which have hitherto constituted a resource for supply. The inquiry for export embraced not only stocks on the spot, but also cargoes on the coast and *in transitu* from Australia and California, and these at the highest market-prices.

The same class of unfavorable conditions retarded the grain-crops of France, and, with the exception of a few favored districts in the south, the general aspect of grain-farming is anything but cheering. Germany also looked with apprehension to short crops, and purchases have been made for direct shipment from America, Russia, and other great grain-fields to meet an expected scarcity. Still later French reports present a less gloomy aspect of affairs, and give rise to hopes in certain quarters that grain prospects are on the mend. In the grain-growing regions of Eastern Europe there is a considerable improvement in the prospects of the growing crops. At Algiers the weather was all that the grain-farmer could desire. At Alexandria, Egypt, small supplies checked business.

The sales of English wheat during the week closing May 20 amounted to 44,989 quarters, at 45s. 1d. per quarter, against 62,370 quarters, at 42s. 2d., during the corresponding week of 1875. The London averages were 45s. 3d. on 2,981 quarters. The imports into the United Kingdom during the week previous, ending May 13, amounted to 660,093 cwt. The following week opened with considerable firmness, though the trade was not remarkably brisk. Fresh supplies of English wheat were small and readily cleared out at previous prices, or with considerable advance. In Mark Lane, Essex, and Kent, white brought 43s. and 52s. per quarter; ditto, red, 40s. and 47s.; Norfolk, Lincolnshire, and Yorkshire red, 40s. and 46s.; Dantzic mixed, 52s. and 56s.; Königsberg, 50s. and 54s.; Rostock, 50s. and 53s.; Pomeranian, Mecklenburg, and Uckermark red, 48s. and 50s.; Shirka, 43s. and 45s.; Russian hard, 45s. and 46s.; Saxonska, 47s. and 48s.; Danish and Holstein red, 46s. and 49s.; American red, 44s. and 54s.; Chilian white, 47s.; Californian, 51s.; Australian, 51s. and 53s.

In Liverpool British white was quoted at 9s. 8d. to 10s. 2d. per cental; ditto, red, 9s. 4d. to 9s. 10d.; Canadian white, 9s. 6d. to 10s.; Red Club and Golden Drop, 9s. to 9s. 9d.; American red, winter, 9s. 6d. to 10s. 4d.; No. 1, Minnesota, 9s. 4d. to 9s. 9d.; No. 1, spring, 9s. 4d. to 9s. 10d.;

No. 2, spring, 8s. 8d. to 9s. 6d.; India, 8s. to 9s. 6d.; Egyptian, 6s. 10d. to 8s. 9d.; Californian, 9s. 8d. to 9s. 11d.; Club, 10s. to 10s. 4d.; Chilian, 9s. to 9s. 6d.; Australian, 10s. 4d.

In Paris choice native wheat had risen to 53s. 7d. and 55s. 5d. per quarter, and other sorts ranging down to 50s. and 51s. for ordinary grades.

FLOUR.—The imports of flour into the United Kingdom during the week ending May 13, amounted to 83,992 cwt., against 95,811 the previous week. The demand had improved, but no change in prices was noted. In Mark Lane the best town-households were quoted at 36s. and 43s. per sack of 280 pounds; best country-households, 35s. and 36s.; Norfolk and Suffolk, 28s. and 30s. Of foreign flour, French brought 30s. and 35s. per sack; American and extra, 22s. and 27s. per barrel of 196 pounds. At Liverpool, English and Irish superfines brought 36s. and 38s.; ditto, extra, 39s. and 41s.; Trieste, 50s. and 57s.; Chilian, 34s. and 35s.; Californian, 35s. 6d. and 38s.; American Western and extra State, 22s. and 25s. per barrel; Baltimore and Philadelphia, 22s. and 26s.; Ohio and extra, 23s. and 26s.; Canadian, 23s. and 27s.

At Paris the range from ordinary brands to the Mark D'Arblay was 38s. and 42s. per 280 pounds.

MAIZE.—In Mark Lane, London, white maize was quoted at 28s. and 30s. per quarter; yellow, 27s. and 28s. In Liverpool, American white and mixed brought 26s. 3d. to 26s. 9d. per 480 pounds; Salatz, 30s.; Danubian, 26s. to 26s. 6d.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JULY, 1876.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1876.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,

Statistical Division, July 19, 1876.

SIR: I respectfully present for publication a report on the condition of the crops in July; a paper descriptive of the agricultural branch of the Centennial Exposition; some official documents from the Spanish Government in regard to tree-planting; a communication from our minister in Mexico in regard to coffee-culture in that country; and the usual variety of minor statistics.

Very respectfully,

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

DIGEST OF CROP REPORTS.

CORN.

ACREAGE.—In New Hampshire, New York, Michigan, and Minnesota the area planted is slightly less than last year. This is doubtless chiefly, if not exclusively, due to the protracted cold and wet spring in those States. Tennessee also returns a decrease of 1 per cent. In Vermont, Delaware, and Maryland the extent of area remains unchanged. In all the remaining States it has been enlarged. Among the States reporting the largest relative increase were, California, 34 per cent.; Massachusetts and Nebraska, 20; Texas, 15; Wisconsin, 10; Georgia and Florida, 9; Rhode Island, Connecticut, and Indiana, 7; Ohio, 6; Arkansas, 5; Maine, South Carolina, Alabama, West Virginia, Illinois, Iowa, and Oregon, 4.

Returns from the Southern States indicate a tendency to increase the corn and grain crops, from a growing conviction that the production of home-supplies will be more conducive to agricultural prosperity than the hitherto prevalent system of overproduction of cotton, which not only depresses its own price, but also enhances the cost of provisions, clothing, &c., produced elsewhere by extending the market for their consumption.

The increase of the entire corn-area of the country, over last year, amounts to 5 per cent.

CONDITION.—The crop, in several sections, is in a condition of more than

ordinary thrift and promise. In the northern section of the Eastern, Middle, and Northwestern States, it is more backward than usual, owing to delay in planting, occasioned by protracted cold and wet weather; but it is generally in a thrifty growing state. In the States on the Atlantic coast the condition ranges from 100 to 108, as far as, and including, Virginia; south of Virginia an extraordinary rain-fall, of six to seven days' duration, about the third week in June, resulted in extensive overflows, occasioned extensive injuries to the crop. In many localities along the water-courses, where it was extensively washed out or otherwise ruined by floods, it has been replanted, and the second growth is pushing forward vigorously. With the exception of that protracted rain-storm along the coast, the weather throughout the Southern States has been generally favorable to clean cultivation and a healthy growth. In Texas an extraordinary crop is nearly matured. The returns show a condition of 121, with an increase in acreage of 15 per cent. Throughout the Ohio and Northern Mississippi Valleys, and in Michigan, June was a very wet month; the rain-fall was so excessive as to seriously interfere with timely cultivation and to foster an extraordinary growth of weeds. Owing to this cause principally, the condition in that section ranges from 100 in Indiana down to 88 in Iowa, Illinois being 89 and Missouri 97. Like causes have reduced the condition in Kansas to 96. On the Pacific coast the crop is unusually promising, the figures being for California 105, and for Oregon 101.

Insect-injuries have been limited to depredations by worms, and those not extensive or serious.

No droughts over extended areas are reported, and local droughts, for the most part, have not been protracted or severe.

Taking 100 as indicating a condition of unimpaired stands and ordinary thrift, the entire crop averages 97.

Details of local exigencies affecting the crop will be found in the notes below.

MAINE.—*Waldo*: Never better. *York*: The best grown for twenty years. *Cumberland*: Promising.

NEW HAMPSHIRE.—*Hillsborough*: Backward, but doing well.

VERMONT.—*Grand Isle*: Did not come up well, owing to wet and cold May. *Rutland*: Much had to be replanted, owing to poor seed and dry weather. *Caledonia*: Late, but good stand.

CONNECTICUT.—*New London*: Somewhat eaten by gray worms, but growing well.

NEW YORK.—*Albany*: Looks very well. *Seneca*: Good color and growing rapidly. *Otsego*: Somewhat backward, but growing well. *Genesee*: Doing finely. *Saratoga*: Much injured by worms. *Washington*: Late, but growing finely. *Orange*: The prospect of a large yield seldom better. *Allegany*: Have never seen corn so large.

NEW JERSEY.—*Atlantic*: Early corn will be ruined unless we have rain soon. *Warren*: Fine, but now suffering a little from dry weather.

PENNSYLVANIA.—*Cameron*: Planted late, but coming forward finely. *Perry*: Backward, but well set. *Clearfield*: Large acreage; backward. *Indiana*: Could not wish a better prospect. *Armstrong*: Late, but even stand and growing finely. *Beaver*: Has suffered from drought. *Butler*: Much late, but all looks well. *Delaware*: Much injured by worms where the hills were not strewn with salt; now quite vigorous. *Clinton*: Late planted. That planted in time very fine. *Lycoming*: Very fine, except a few complaints of the white worm injuring the roots. *Elk*: Very fine.

MARYLAND.—*Caroline*: Looks well. *Howard*: Promising. *Worcester*: Late, but promising. *Baltimore*: A good stand. *Washington*: Good.

VIRGINIA.—*Caroline*: Favorable season. *Madison*: Looking well. *Russell*: Injured by the cut-worm. *Tazewell*: Injured in some neighborhoods by the wire-worm. *Chesterfield*: Large acreage; good stand; well worked, and very promising. *Matthews*: Being seriously injured by worms. *Powhatan*: Backward. *King George*: Promises finely. *Middlesex*: Thrifty. *Orange*: Has suffered from drought. *Spottsylvania*: A very large acreage; well grown. *Campbell*: Promises well. *Dinwiddie*: Increased acreage; in fine condition. *James City*: The dry June has put our corn in beautiful order; ready for rain. *King and Queen*: Backward. *Prince Edward*: Checked by dry weather. *Sussex*: The crops splendid, but now suffering somewhat on stiff bottoms from drought.

Elizabeth City: Smaller area, but more promising. *Halifax*: Increased acreage, owing to failure in tobacco-plants; well worked, and looking healthy. *Charles City*: Injured by a severe drought for the last four weeks. *Highland*: Never better. *Mecklenburgh*: Looking well where worked in time. *Northampton*: Promising, notwithstanding the drought.

NORTH CAROLINA.—*Rutherford*: Injured by overflow; replanted to a considerable extent. *Wilkes*: Badly injured by freshet June 17. *Pasquotank*: Favorable season for cultivating; late, but looks well. *Caldwell*: Much lost by overflow and other injury from rain-storms. *Cherokee*: A small worm has proved so destructive to the crop on low land that not more than 33 to 50 per cent. of a crop can be raised on such land. *Alamance*: Late, but good stand and promising. *Wilson*: Fair prospect for a good crop. *Caswell*: Very promising. *Duplin*: Better than ever known. *Person*: Increase in acreage, owing to failure of tobacco-plants. *Pitt*: Very favorable weather in June, and a large crop promised. *Nash*: Early planted, very good; late, a bad stand and small. *Beaufort*: Very fine. *Hertford*: Increased acreage in good condition. *Polk*: Much wasted away, and much under water so long that it rotted; more than 33 per cent. planted over.

SOUTH CAROLINA.—*Edgefield*: Small, but good stand and vigorous. *Laurens*: Vast quantities washed out or killed by devastating storms; much replanted. *Beaufort*: A rain-storm in June, lasting a week, during which upward of 15 inches of water fell, did great injury to the crop. *Clarendon*: In a critical state for want of rain. *Colleton*: Never better. *Chester*: On low lands, along water-courses, almost destroyed by overflow. *Georgetown*: A good stand, checked by drought in May, and now too wet to plow. *Lexington*: Inferior, having suffered first from drought and then from excessive rain. *Marlborough*: Very good. *Richland*: Much injured and destroyed by a freshet. That destroyed planted over, with a fair prospect. *Fairfield*: Fair prospect for a good crop. *Horry*: Badly damaged by heavy rains, June 10 to 20. *Spartanburgh*: Heavy rains June 11 to 18, flooded all bottoms, and corn along large streams was completely destroyed. The farmers have planted it over. *Orangeburgh*: Very much injured by heavy rain-storms.

GEORGIA.—*Dooly*: Promises a fine yield. *Elbert*: A freshet in June destroyed corn and cotton in the bottom-lands, but these lands are being replanted with corn. *Fannin*: Never better. *Thomas*: Never better, and larger acreage than since the war. Forward corn is made, and one or two showers will make the whole crop good as the ground can bear. *Towns*: Very late and much damaged by a recent freshet. *Troup*: Prospect very good. *Upson*: Finest prospect for ten years. *Gwinnett*: Unusually fine and forward on upland; too wet on lowland. *Clayton*: Never more promising on upland; too wet on bottoms. *Columbia*: Looking well. *Hall*: Very small; too much rain. *Hancock*: More planted than in any year since the war, and the finest ever seen. *Henry*: Acreage increased 25 per cent. *Laurens*: Very small, but healthy and vigorous. *Madison*: Bad stand and two weeks late; on lowlands 30 per cent. was destroyed by overflow; now being replanted. *Mitchell*: The most promising since 1865; one more "good season" and the largest yield for years will be secured. *Rabun*: Very much damaged by freshets and bud-worms. *Randolph*: Very good. *Spalding*: Promises to exceed any crop for fifteen years. *Union*: Good on uplands, but no stand on bottoms, owing to ravages of bud-worms. *Whitfield*: Much injured on lowlands by the great quantities of rain in June. *Dodge*: Very good prospect. *Haralson*: Two weeks late, but looking well. *Jefferson*: Good. *McDuffie*: A dry May and wet June have been the life of the crop. *Cobb*: Finest prospect for years. *Walton*: Very promising. *Hart*: Good crop. *Jackson*: Washed away on bottoms; on upland good where well worked. *Lincoln*: The great profusion of rain 11th to 18th of June, overflowing the bottoms, entirely destroyed whole crop; a large portion has been replanted and is doing finely. *Terrell*: Prospect much improved during June. *Appling*: Rather backward, owing to dry and extreme hot weather, which caused it to burn badly, and especially that well manured. *Carroll*: Though small, looks very fine; well worked.

FLORIDA.—*Madison*: Greater acreage and better condition than last year. *Jackson*: Well worked and looks well. *Gadsden*: The prospect very flattering.

ALABAMA.—*Baldwin*: First planting nearly all killed. *Clarke*: Early and late planted doing well. *Greene*: Poor prospect. *Crenshaw*: Good prospect on dry land. *Calhoun*: Prosperous. *Jefferson*: Late ten days, but fast recovering. *Barbour*: Free from grass, and the season very favorable. *Lauderdale*: The cut-worm has been very destructive on all low lands. *Blount*: Backward. *Conecuh*: Well worked out, and fine. *Colbert*: Large and very fine crop. *Cherokee*: Looks very well where cultivated.

MISSISSIPPI.—*Jefferson*: Ruined by long drought. *Lincoln*: Materially injured by a drought through the whole of June. *Lee*: Late three to four weeks, and foul, owing to damages by heavy floods June 1 and 15; some yet to plant. *Grenada*: Promising where well cultivated. *Amite*: Increased acreage, and greater attention to the crop than for several years. *Pike*: Doing well. *Perry*: Looks 10 per cent. better than last year. *Monroe*: Will make enough for home consumption. *Lowndes*: The prospect not

so good as last year. *Newton*: Well worked, clean, and prosperous. *Chickasaw*: Promising where well worked; the freedmen laboring well. *Choctaw*: Increased acreage, owing to the fact that many plowed up cotton and planted corn. *Franklin*: Materially injured by drought.

LOUISIANA.—*Concordia*: A large increase in the acreage; more disposition to go into farming and quit the ruinous cotton-planting. *East Baton Rouge*: In all the neighborhoods where the labor has not been interfered with, in splendid condition. *Madison*: Backward, but growing well. *Carroll*: The yield will not come up to last year. *West Feliciana*: Splendid up to this time, but beginning to suffer from drought. *Jackson*: Backward, but very promising.

TEXAS.—*Bastrop*: Fine, with much larger acreage than last year. *Coryell*: Better than for years; a full crop sure. *Harrison*: Raising a heavy crop. *De Witt*: Suffering from dry weather. *Upshur*: Indications of a yield 75 per cent. above last year. *Colorado*: A little late, but one of the most promising crops for years. *Lavaca*: Splendid, though now suffering from drought in localities. *Williamson*: A promise of the largest crop ever made; of fine quality. *Caldwell*: Never better. *Medina*: Injured by a drought of two and a half months, but now improving. *Red River*: Now silking, with a prospect of a very heavy crop. *Matagorda*: Improved by rains. *Waller*: The crop made sure, and will be of full weight. *Austin*: Secured by the late rains, and sufficient for home consumption. *Burleson*: Doing well. *Collin*: Almost made; will be a fine yield. *Dallas*: Never better. *Gillespie*: Very good. *Smith*: Very fine on red land; too wet on gray land. *Titus*: Large acreage and better prospect than for many years. *Washington*: Heaviest crop ever raised. *Bexar*: Never better; all made. *Burnet*: Early planted, splendid; late, doing well. *Fannin*: Good; the most favorable season for years. *Travers*: Never better.

ARKANSAS.—*Boone*: Suffering from lack of cultivation, owing to excessive rain. *Saint Francis*: Late, but looking extremely well. *Baxter*: The smallest ever known. *Monroe*: Crop will be abundant. *Arkansas*: Looks remarkably well; but a small black beetle, which seems to feed on the roots, has injured it 10 per cent. Have seen ten to twenty-five in a hill. *Bradley*: Irregular, and rather late. *Izard*: Is healthy, clean, and nice, and promises a large yield. *Fulton*: Well worked, healthy, and growing finely. *Marion*: Small, but looks well. *Ouachita*: Not doing well.

TENNESSEE.—*Anderson*: Bad stand; a small worm cut off the roots. Some have planted two and three times. *Lincoln*: Well cultivated, and looks unusually well. *Blount*: Generally looks well, though injured badly in places by the bud-worm. *Gibson*: Late planted, and damaged by rains in low lands. *Loudon*: Fine. *Rhea*: A good season for corn. *Sullivan*: Growing finely. *Hawkins*: Looks well. *James*: Too much rain for corn on low lands. *Knox*: Much damaged on the river-bottoms by overflow. *Bedford*: Looks fine. *Giles*: Never more promising. *Robertson*: Backward, but looks very well. *Van Buren*: Depredations by the bud-worm. *Obion*: Damaged by overflow. *Greene*: Irregular, but thrifty. *Sequatchie*: Damaged considerably by the bud-worm and other insects. *Montgomery*: Never better. *Trousdale*: Looking well.

WEST VIRGINIA.—*Tucker*: Acreage two hundred; looks well. *Pocahontas*: A fine prospect. *Grant*: A little backward. *Pendleton*: A little late, but very promising. *Cabell*: Promising. *Monroe*: First rate. *Wetzel*: Promises a good crop.

KENTUCKY.—*Daviess*: Damaged badly by excessive rains. *Ohio*: Drowned out in a portion of the county. *Spencer*: Clean and in fine condition. *Bath*: Decidedly improved by rains for the last ten days. *Gallatin*: Materially injured by drought. *Mason*: Looks remarkably well; the ground well tilled and clean. *Metcalfe*: Looking well. *Owsley*: The prospect better than for years. *Russell*: Injured by the wire-worm, a little black bug, and the corn-louse; but all clean and improving rapidly. *Hardin*: Looks well. *Calloway*: Looks well.

OHIO.—*Adams*: Small, but good stands and well worked. *Holmes*: Growing rapidly, but in weeds and grass, owing to wet weather. *Perry*: Coming forward very rapidly. *Vinton*: Good stand, but small. *Washington*: Much of the crop late, but growing rapidly. *Defiance*: Damaged by excessive rains. *Miami*: Never better. *Jackson*: Small, but warm showers are bringing it out fast. *Wayne*: Good on uplands; injured on lowlands by heavy rains. *Mercer*: Largely increased acreage, in fine condition.

MICHIGAN.—*Montcalm*: Never so backward; many fields not yet touched with the plow or hoe. *Ottawa*: Too much rain. *Wayne*: Planted late, and wet weather has prevented proper cultivation. *Wexford*: Late in coming up, but growing very rapidly. *Lenawee*: Very backward. *Calthoun*: Injured by continuous heavy rains, which have prevented working. *Hillsdale*: Set back somewhat by the wet weather. *Ionia*: Very backward, owing to heavy and continuous rains; impossible to work in it. *Leelanaw*: Never more promising. *Allegan*: Very weedy, owing to continuous rain. *Barry*: Small and backward. *Mason*: Looks well. *Newaygo*: A greater fall of rain in June than ever before, and the indications are that the crop will be the poorest ever seen here. *Tuscola*: Rains have delayed cultivating, and weeds are getting a large start of the crop. *Muskegon*: Suffering on heavy land from excessive rains. *Macosta*: Materially damaged by excessive rains.

INDIANA.—*Brown*: A fine growth, in fine cultivation. *Jennings*: Gone up on wet land; weedy, but looking well, on dry land. *Lake*: Remarkably heavy and continuous rains for three weeks past, and many fields beyond redemption. *Stark*: Injured by the rainy weather. *Decatur*: Promises the largest crop ever produced. *Steuben*: Much trouble from failure in seed-corn; hundreds of acres replanted. *Fayette*: The stand is extra good. *Hamilton*: A very large crop planted; small, but looks exceedingly well. *Hendricks*: Good. *Jasper*: Much in bad condition owing to rains for the last four weeks. *Kosciusko*: Growing finely, but very weedy owing to continual rains. *Martin*: Becoming foul, and too wet for cultivating. *Morgan*: Never a larger crop or a better prospect. *Noble*: Too wet for working the crop. *Pike*: Injured by the rains on flat lands; otherwise the prospect good. *Spencer*: June a very wet month; corn a failure on low land, and the weeds have the advantage decidedly on the uplands. *Wabash*: Too wet for cultivating. *Wells*: Being injured in places by the wet weather. *Whitley*: Seldom better. *Johnson*: Scalding on the flat lands, owing to continual rain; no work being done, and the weeds growing.

ILLINOIS.—*Clinton*: Large crop, but poorly worked. *Effingham*: Too wet for cultivating. *Grundy*: Cultivation almost entirely prevented the last three weeks by excessive rains. *Jersey*: Growing finely. *Lake*: Looks well. *Menard*: Rains constant but light and the crop unusually clear of weeds. *Mercer*: Grassy. *Putnam*: On the bottoms, mostly ruined by overflow. *Sangamon*: Some injury from excessive rains. *Schuyler*: Small from late planting, but the ground never in better condition or clearer of weeds. *Saint Clair*: Splendid; clear of weeds. *Shelby*: The weeds will take the late corn before the ground is dry enough to work. *Fermillion*: In a critical condition, from excessive rains. *White*: Considerable already lost on low lands, from excessive rains. *Williamson*: The meadows are flooded and corn on low grounds is seriously injured. *De Kalb*: Not promising, owing to excessive rain-fall; many fields untouched since planting and likely to remain so. *Iroquois*: The wet weather for the last four weeks has cut off the prospect nearly one-half. *Livingston*: The outlook bad; it has rained for nearly two months. *Mason*: A little backward, but clean and looking well. *Rock Island*: Much planted late, but good stand. *Carroll*: Slow growth and prolific weeds, owing to the excessive rains. *Lee*: Too much rain for a healthy condition. *Monroe*: Backward and weedy, but strong and thrifty. *Montgomery*: Rather yellow in places, but a few days of sunshine will make it all right. *McLean*: On low, flat lands will make only a little fodder, owing to incessant rains.

WISCONSIN.—*Clark*: Crops backward. *Dunn*: Late planted, on account of excessive rains, and in some cases the crops withered by subsequent decline of temperature; doing better now. *Dodge*: Crops look well. *Douglas*: Seeding delayed by cold spring. *Green Lake*: Backward. *Outagamie*: Looks well; abundant rains. *Richland*: Weedy, yet looks well. *Saint Croix*: Backward. *Walworth*: Very uneven; too much rain after planting.

MINNESOTA.—*Wright*: Good.

IOWA.—*Appanoose*: As fine a crop as ever raised here. *Buena Vista*: Drought. *Cherokee*: Rescued by late rains. *Clinton*: Too much rain. *Des Moines*: Too much rain. *Hardin*: Growing finely. *Howard*: No frosts since May 1; quite unusual; retarded, however, by cold spell. *Johnson*: Half the crop good, being well cultivated and early planted; the other half delayed by bad weather at planting and not good. *Madison*: Late. *Mahaska*: Late, but healthy. *Tama*: Seasonable for corn. *Jefferson*: Rain prevented working. *Monona*: Injured by drought, but rain has come at last. *Washington*: Growing well on flat land, but poor on rolling upland.

MISSOURI.—*Phelps*: Cannot be properly worked, owing to excessive rains. *Barton*: Cannot be cultivated. *Chariton*: Stands injured by field-mice; some fields so ravaged as to require second planting. *Nodaway*: Backward, but promising. *Caldwell*: Needs working, but we cannot get into the field without miring. *Dallas*: Backward. *Daviess*: Very backward, and one-half not plowed at all, owing to continued heavy rains. *Dunklin*: Favorable. *Mississippi*: Not well cultivated, owing to the rains. *Pettis*: Very flattering. *Shelby*: Scalding, and suffering for want of cultivation. *Stone*: Late fifteen days, but looks well. *Vernon*: One month late. *Clay*: Late. *Dent*: Late, but thrifty. *Maries*: Suffering for want of cultivation. *Montgomery*: Weedy and grassy. *Grundy*: Too wet for corn; much on bottom-lands has not been plowed at all. *Perry*: Three weeks late, but looks well. *Buchanan*: Looks well.

KANSAS.—*Bourbon*: Backward and very weedy; too much rain. *Chase*: Very late, but clean. *Johnson*: Weedy; too much rain. *Franklin*: Very weedy; no plowing can be done as the ground is thoroughly soaked, and it is still raining. *Jackson*: Rather backward, but looks well. *Labette*: On the prairie, rather short; too much rain; better on the bottoms. *Linn*: On wet land, weedy; on upland, the best prospect for years. *Lyon*: Much rotted in the ground, owing to excessive rains. *Miami*: Growing beautifully. *Cherokee*: Fully half has not been cultivated at all, owing to wet weather. *Neosho*: Many fields very weedy and not much prospect of getting them clean. *Reno*: Extra good.

NEBRASKA.—*Knox*: Hurt by frost when coming up. *Boone*: Injured by extreme

cold previous to June 20. *Stanton*: Badly damaged by the cut-worm and gopher. *Antelope*: Excellent stand and very promising. *Dodge*: Early planted, doing well; late planted, very backward. *Wayne*: Promises better than usual.

CALIFORNIA.—*Siskiyou*: Materially damaged by the frosts. *Yuba*: Increased acreage and fair crop. *Sonoma*: Greatly increased acreage and yield.

OREGON.—*Clackamas*: Very backward.

UTAH.—*Weber*: Backward, but looking well.

DAKOTA.—*Darison*: Doing well. *Buffalo*: Suffering from severe drought. *Richland*: Cut short at least one-half; drought and young grasshoppers.

NEW MEXICO.—*Taos*: Has escaped the grasshoppers to some extent, but may not after they have finished the wheat.

WINTER-WHEAT.

The condition of winter-wheat, taking the whole country together, advanced from 87 per cent. of an average, June 1, to 95 per cent. July 1. In New England, Massachusetts is full average and Maine 2 per cent. above. The small crop of this section exhibits a decided improvement in all the States except New Hampshire, which shows a slight decline.

Of the Middle States, Delaware maintains her high June condition, 105. New Jersey lost heavily through local drought, but the large crops of New York and Pennsylvania, by a rapid improvement, have approximated a full average. In some counties of this section the Hessian fly was destructive, but the fine general conditions of the growth not only compensate for losses from this source, but also largely repair the serious damage from winter-killing. Generally, bottom-crops are heavy, while on clay hill-side the stalks are finely headed, though not very thick on the ground. The Fultz wheat still maintains its prestige upon its natal soil. In Lancaster, Pennsylvania, it yielded from 30 to 35 bushels per acre, while other varieties alongside returned only half as much.

Of the South Atlantic States, Maryland alone holds her high June average, 108. Virginia has slightly declined, but still reports 111. The other States all show a serious falling off and are below average, Georgia promising but two-thirds of a crop. In the southern counties of this section frequent rains at a critical stage in the growth of the crop induced rust, while local freshets destroyed a considerable amount of harvested grain. Cherokee, Georgia, reports the Jennings wheat from the Department as a decided success. The Hessian fly was troublesome in a few localities.

Of the Gulf States, all are below average. A small improvement is shown in Mississippi and Texas, but Alabama has fallen to two-thirds of an average through heavy rains producing rust. Several counties report the grain light and poor. In Wilkinson, Mississippi, the Clawson and Jennings wheats rusted badly. The Mediterranean and Walker wheats made fair crops in Cooke, Texas, while other varieties did not average over one-fourth. The fly and rust are noted in several portions of the latter State.

Of the inland Southern States, West Virginia raised her high June condition to 115, and Kentucky raised hers to nearly average, but Tennessee fell below, and Arkansas declined to two-thirds of a crop. The unfavorable conditions here were mostly the same as in the more southern States, rust being produced by untimely rains. Losses of harvested grain by floods add to the disappointment of shortened yields.

North of the Ohio River, Michigan and Illinois are nearly average, and the other States over 80. This region has shown a marked improvement during June, as a whole, only Michigan showing a slight falling

off. The conditions of growth were very favorable in many localities, but the injuries from winter-killing were too extensive to be easily repaired. The midge, in some counties, added its annoyance to the greater injury of the rust. The fly was also injurious in a few places, and the chinch appeared in one or two counties of Illinois.

West of the Mississippi River the crop prospects improved in all the States except Nebraska, which held its high June condition of 110. Missouri and Kansas rose above average, while Minnesota and Iowa remained below. Osage, Missouri, reports drilled wheat as 50 per cent., and Sedgwick, Kansas, 100 per cent., better than broadcast. The Hessian fly and chinch did some local damage, while heavy rains in some quarters produced rust. In Ellis, Kansas, very early-sown wheat produced a fine crop; later-sown did poorly.

The Pacific States are both below average, and both fell off in condition during June. Yet local yields are reported as larger than ever before. Linn, Oregon, complains of excessive wet weather.

NEW YORK.—*Westchester*: Splendid. *Livingston*: Better than last year 25 per cent., but yet below an average crop. *Genesee*: Has done well where not winter-killed.

NEW JERSEY.—*Warren*: Not more than half a crop.

PENNSYLVANIA.—*Cameron*: Best prospect for years. *Perry*: Badly injured by the fly. *Snyder*: Being cut in the stem by the Hessian fly. *Clearfield*: Will be light. *Indiana*: Better than anticipated; well filled. *York*: Large crop. *Armstrong*: Better than was expected the first of June. *Beaver*: Not a full crop, but plump berry. *Lehigh*: Injured by the Hessian fly. *Westmoreland*: Prospect of a very large crop of very fine quality, though somewhat rusted. *Bedford*: Very good in the northern part of the county. *Bucks*: Improved wonderfully; deficiency from winter-killing will be made up by extra yield. *Lancaster*: Pretty good, though some fields much injured by the fly. The Fultz proves to be by far the best variety. It will yield 30 to 35 bushels per acre where other varieties will yield only half of that amount. It is less injured by the fly. *Union*: Much of it in the shock, and a good crop throughout the county. *Clinton*: Injured by Hessian fly. *Lycoming*: On bottoms, very heavy and good; on clay lands, thin but fine heads. *Elk*: Promise of the largest aggregate yield ever raised.

MARYLAND.—*Caroline*: Never such a crop before. *Worcester*: Very good. *Harford*: About all cut; heads well filled and grain plump. *Talbot*: Shriveled by premature ripening. *Wicomico*: Being harvested; free from rust and injury from damp weather. *Washington*: All gathered, and will turn out well.

VIRGINIA.—*Cumberland*: The harvest over, and a bountiful crop. *Loudoun*: Injured by the fly. *Madison*: Good in quality, but 25 per cent. short, owing to fly and rust. *Russell*: Some damaged by the fly. *Warwick*: Harvested; the grain shrunk from rust on the blade. *Chesterfield*: Best crop for ten years; all harvested in good condition. *Ponchatan*: Not so well filled. *Fluvanna*: Good. *Lunenburg*: Harvested, and the yield good. *Middlesex*: All harvested, with a yield above average. *Page*: Have had fine weather for securing the crop, now all in the shock, and very good in quantity and quality. *Prince William*: Some injury by Hessian fly; quality better than anticipated. *Spottsylvania*: Did not fill as well as anticipated. *Campbell*: Excellent. *Dimmick*: All harvested, and the best crop for ten years. *James City*: In the shock, and growers well pleased with the result. *King and Queen*: Very fine. *Pulaski*: On uplands, thin but excellent in quality; on low lands, affected with rust, and nearly all fields more or less with scab. *Smyth*: An extraordinary crop; now in the midst of harvesting. *Elizabeth City*: Being harvested; in fine condition. *Halifax*: Splendid season for securing the crop, which promises well in yield and quality. *Augusta*: Better than usual. *Highland*: Never better. *Mecklenburgh*: Good yield of fine quality.

NORTH CAROLINA.—*Pasquotank*: Promises well. *Wilkes*: Cut short by rust and spot. *Caldwell*: Much destroyed by overflow and injury from rains. *Gaston*: A week of cloudy and rainy weather in harvest has reduced the condition from 100 to 60. *Wilson*: The best crop for years. *Duplin*: Better than ever known. *Nash*: Harvested, and very good. *Pamlico*: For the first time in many years a few bushels of winter-wheat were sown, and the yield was very good. *Perquimans*: Harvested; the best for years. *Roman*: A freshet in the Yadkin River carried away several thousand bushels of wheat in the shock. *Camden*: A good crop housed. *Hertford*: The best crop since the war; increased quantity, and the grain perfect. *Alexander*: Injured by rust. *Burke*: Reduced 25 per cent. by overflows. *Folk*: Injured by rust, and 25 per cent. lost by rains.

SOUTH CAROLINA.—*Clarendon*: Harvested; much complaint of rust. *Chester*: Dam-

aged 10 per cent. by excessive rain for six days. *Newberry*: Continuous rain for six days has caused wheat to sprout. *Lexington*: Much of it, cut and left in the field, sprouted during the wet spell. *Spartanburgh*: Much injured by rust, and by rains in harvest. *Orangeburgh*: Harvested; 10 per cent. above average. *Marion*: Superior yield and quality. One farmer produced 26 bushels per acre.

GEORGIA.—*Dooly*: Housed, and the finest yield since the war. *Elbert*: Continued rains for a week in harvest have injured the crop. *Gordon*: Not over 3 bushels per acre; injured by fly and rust. *Fannin*: Early, fine; late, infected by millions of lice. *Towns*: Best for years. *Troup*: Housed; crop short. *Upson*: Long straw, but dwarfed grain; injured by red mold. *Gwinnett*: Injured by rust 33 per cent. or more. *Baldwin*: An acreage of 150 harvested; the berry in some localities smaller than usual. *Butts*: Reduced to 60 by fly and rust. *Cherokee*: Almost a failure, but the Jennings wheat from the Department did well. *Clayton*: Reduced to 50 by fly and blade-rust. *Hancock*: Very fine. *Henry*: Half a crop. *Randolph*: Very good crop harvested. *Richmond*: The bulk of the crop damaged by the excessive rains. *Union*: In the midst of harvest; much smut in it; think the yield will be above average. *Coweta*: Injured by blade-rust 45 per cent. *Jefferson*: Unusually large and good crop. *McDuffie*: Better than last year. *Cobb*: Harvested, and almost a failure from rust and fly. *Walton*: Generally thrashed; not over half a crop. *Hart*: Harvested a good crop. *Jackson*: Hardly 25 per cent. of a crop. *Lincoln*: Large individual losses by the flood sweeping off the shocks from bottoms, and considerable damage by sprouting in the shock. *Fulton*: Badly damaged by rust. *Carroll*: Cut short by fly and rust.

ALABAMA.—*Chambers*: The estimate of 100, June 1, proved by thrashing to be 25 per cent. too high; rust. *Crenshaw*: Good. *Calhoun*: Being thrashed, and not nearly as good as anticipated. *Lauderdale*: Much damaged by rust and wet weather. *Blount*: Reduced by rust more than half in quantity, and the quality poor. *De Kalb*: Some has been thrashed, and makes a poor yield of sorry grain. *Cherokee*: Thrashed; yield light and quality poor.

MISSISSIPPI.—*Grenada*: The white winter-wheat from the Department has done well; all other kinds a failure from rust. *Wilkinson*: Clawson and Jennings wheat both rusted badly. *Covington*: All ruined by rust.

LOUISIANA.—*Jackson*: Cut short by rust.

TEXAS.—*Bezar*: Thrashed; yield 10 bushels per acre; grain plump. *Cooke*: All varieties, except Mediterranean and Walker, reduced by rust to 25 per cent. of a crop. *Coryell*: The average 25 per cent. above and the yield 25 per cent. below last year. *Upshur*: Harvested; yield 10 per cent. more than last year. *Bandera*: Being thrashed; better than anticipated. *Touzel* makes over 30 bushels per acre, and for seed is selling at \$3, while other wheat sells at \$1.20. *Williamson*: Cut short by rust. *Caldwell*: The acreage 150 but the yield only 50, owing to drought in March and April. *Medina*: Curtailed by a drought of two and a half months. *Red River*: Rusted badly. *Burleson*: Harvested; yield 13 bushels per acre. *Collin*: Damaged by rust and Hessian fly. *Dallas*: Yield per acre short, but the acreage increased. *Gillespie*: Injured by late frost and drought. *Titus*: Half destroyed by rust. *Fannin*: About 11 bushels per acre. *Travis*: Rusted.

TENNESSEE.—*Madford*: Being thrashed in fine condition; quality good. *Bradley*: Being damaged in the shock. *Giles*: Thrashed; falling off in yield, but acreage larger than ever before. *Meigs*: Considerably damaged by rust. *Robertson*: Fine; grain good. *Dickson*: Thrashing just commenced; will not turn out as well as last year. The grain is good. *Polk*: Cut short by rust. *Greene*: Somewhat injured with scab or smut. *Rutherford*: The yield not good as last year, but the quality never better. *Sequatchie*: Badly injured by rust, spot, and smut. *Trousdale*: The heads light and not well filled.

WEST VIRGINIA.—*Pocahontas*: Good. *Berkeley*: Best for eight or ten years. *Braxton*: Very good; well filled. *Grant*: One of the largest crops ever gathered, now being harvested. *Greenbrier*: Unusually fine. *Pendleton*: Very good. *Putnam*: A condition much above average being reduced by excessive rains in harvest. *Jackson*: In the midst of harvest; favorable reports. *Cabell*: The grain fine; some fields injured by joint-worm and rust. *Monroe*: Being harvested; grain-crop of excellent quality. *Wetzel*: Being harvested in good condition. *Doddridge*: Half harvested; more than an average crop.

KENTUCKY.—*Pendleton*: Thin on the ground, but the grain well matured. *Spencer*: Fine quality, but short yield. *Webster*: Endangered by rains in harvest. *Bath*: All harvested, in good condition; quality extra. *Mason*: Thin and short straw; but the heads large and well filled. *Metcalf*: Never better. *Russell*: All cut, and splendid. *Warren*: Yield and quality much better than usual. *Shelby*: Thin stands, but good heads. *Lewis*: About 67 per cent. harvested, with satisfactory results. *Hardin*: About half a crop. *Callaway*: Damaged by heavy rains in June; much sprouted before being cut.

OHIO.—*Adams*: Thin, but well filled and of fine quality. *Delaware*: What was left is coming out very well. *Fairfield*: That which stood the freezes, well filled, and of fine

quality. *Geauga*: Has improved very much. *Perry*: Thin, but very well filled; *Fultz* and *Clawson* the best varieties. *Shelby*: Fine condition, but only half crop. *Vinton*: Thin and short, but plump berry. *Washington*: Some very excellent crops. *Wood*: The crop will be small, but the berry plump. *Coshocton*: About all in the shock in good condition. *Lucas*: Late wheat badly rusted. *Sandusky*: Better than was expected; will be half a crop. *Muskingum*: In the midst of harvest, and heavy rains almost daily. *Mercer*: Above average in quality.

ARKANSAS.—*Boone*: Badly damaged by the fly. *Cross*: Damaged by rains. *Saint Francis*: Considerable rust. *Bacter*: Harvested; half a crop. *Crawford*: Suffered from rain during harvest. *Tell*: Damaged by rust. *Clay*: Injured by rust. *Franklin*: Harvested; below average in yield, but made up by increased acreage. *Prairie*: The Jennings white wheat the best we ever had. *Izard*: Now in the shock; will make a very small yield. *Fulton*: Very indifferent. *Johnson*: Injured by rain in harvest and shock. *Marion*: Rusted badly.

TENNESSEE.—*Anderson*: Damaged by rust. *Decatur*: Damaged by rust. *Lincoln*: Twenty-five or 30 per cent. was sown unusually late and is much damaged by rust, yet the entire crop will fall very little below average. *Blount*: Not more than half a crop, owing to rust and spot. *Gibson*: Injured by rust and wet weather. *Henry*: Harvested in fair condition. *Johnson*: More than half harvested; the best for years. *Loudon*: Badly damaged by rust. *Monroe*: Damaged by rust, and in the shock by rains. *Smith*: Not more than 75 per cent. of a crop. *Sullivan*: Harvested in good condition; some smut. *Knox*: Injured by rust and by rain for the last ten days; many shocks on the bottoms washed off. *Sevier*: Early sown, very good; late, injured with spot.

MICHIGAN.—*Montcalm*: Heavy straw, but many fields badly injured by rust. *Wayne*: Beginning to rust. *Grand Traverse*: Some injured by the fly. *Hillsdale*: All not winter-killed looks well. *Ionia*: The midge and wet weather doing much damage. *Leelanaw*: Never more promising. *Midland*: Never looked better. *Allegan*: The Clawson and Fultz wheats look splendid, and do not rust as other varieties do. *Barry*: Rusting. *Mason*: Looks very well. *Newaygo*: Looks very slim. *Mecosta*: Retarded by excessive rains.

INDIANA.—*Brown*: Thin, but the grain good. *Decatur*: The crop very light, but the grain good. *Steuben*: Has improved wonderfully. *Switzerland*: Thin stand, but quality never better. *De Kalb*: The weevil in smooth wheat will reduce the crop 25 per cent. *Howard*: Some fields entirely destroyed by the midge. *Bartholomew*: The crop, unpromising April 1, turns out almost a full average in quantity and quality. *Carroll*: In the midst of harvest, and the wet weather threatens to ruin the crop. *Fayette*: A thin stand in many fields, but the quality is good. *Floyd*: If not injured by rains in securing, the finest for fifteen years. *Gibson*: Endangered in the shock by continual rains. *Hamilton*: Not over half a crop; the weevil has destroyed 25 to 33 per cent.; good in quality. *Hendricks*: Cannot be cut owing to rains. *Kosciusko*: Harvesting, and it will be bad for the crop if the rains continue. *Martin*: Harvesting under great difficulties, as it rains nearly every day. *Morgan*: Fultz wheat does remarkably well. *Noble*: Not more than half a crop. *Orange*: All cut and in the shock. *Pike*: Fear of injury from the continual rains. *Wabash*: The weevil, in all parts of the county, will destroy 25 per cent. of the crop; but the Fultz wheat appears to be weevil-proof. *Washington*: Some very thin stands, but all well headed and good grain; all in the shock, but very unfavorable weather for stacking. *Warren*: Ready for harvest, but too much rain. *Wells*: Light crop but plump berry; the weevil doing some damage, but not serious. *Clarke*: Excellent in quality. *Johnson*: Sprouting.

ILLINOIS.—*Clinton*: Very little stacking done; too much rain. *Crawford*: Spoiling in the shock. *Effingham*: Light crops, but good in quality. *Jersey*: Good in yield and quality; the finest crop since 1864. *Marion*: But little on the ground, and that badly injured. *Menard*: Best crop for many years. *Sangamon*: Spoiling in the shock. *Saint Clair*: Harvested in fine condition; the kernel very good. *White*: The quality very good, but the rains are spoiling it. *Williamson*: In the shock; the yield better than last year, but the rains threaten ruin. *Mason*: Good. *Perry*: Thin stand, but good, plump grain; in the shock, and in danger from excessive rains. *Madison*: Heavy and of good quality. *Pulaski*: Great improvement in the ripening season; all in the shock. *Monroe*: Sprouting in the shock; considerable destroyed by the overflow of the Mississippi. *Montgomery*: Thin stand, but fine, plump grain; in danger from wet weather.

WISCONSIN.—*Richland*: Badly winter-killed. *Walworth*: Largely winter-killed. *Washington*: Rust.

MISSOURI.—*Cass*: The best crop for many years. *Phelps*: Light crop; Hessian fly injured it in localities. *Barton*: Fine. *Osage*: That put in with the drill, 50 per cent. above average; that sown broadcast, 50 per cent. below. *Chariton*: Injured by continuous rains. *Caldwell*: Ready to cut, but we cannot get into the fields with reaping-machines. *Daviess*: Very fair crop. *Douglas*: Badly damaged with the bug and fly; Fultz wheat the best in the county. *Franklin*: Will sprout unless the rain soon

ceases. *Jasper*: Mostly harvested; extra large fields and extra quality. *Jefferson*: Badly rusted. *Johnson*: The fields wet and miry. *McDonald*: Thin stand, but good grain. *Pettis*: In the shock, and endangered by rains. *Platte*: The yield above 20 bushels per acre, and the grain full and plump. *Ralls*: Never better. *Ripley*: Endangered in the shock. *Saint Charles*: Damaged by rust on bottom-lands. *Stone*: Badly damaged by rust, spot, and blight. *Clay*: Fine, but endangered by rains. *Dent*: Materially damaged by the heavy rains; much washed away. *Grundy*: Looks well. *Perry*: Thin stand, but good, plump berry; in the shock and sprouting badly.

KANSAS.—*Saline*: Damaged by a green worm when heading in June. *Sedgwick*: Drilled yields double that sown broadcast. *Bourbon*: In the shock in good order; the Jennings and Minorea wheat from the Department promise well; less affected by rust than other kinds. *Chase*: A worm has been eating the heads to some extent; grain light, and of inferior quality. *Elk*: Greatly injured by much rain and high water. *Franklin*: In the shock. *Jackson*: Never better; will be more in the county than ever before, if not injured in the shock. *Labette*: Badly affected with rust and scab; threatened with sprouting in the shock. *Lyon*: Rusted to some extent. *Miami*: Cut; very fine. *Montgomery*: Not so well filled as expected, owing to wet weather; some crops ten feet under water at the time of heading. *Cherokee*: Injured by rust and the Hessian fly. *Ellis*: That sown in August or early in September has made a good crop; but most of it was sown later, owing to the difficulty of procuring seed, and did not sprout till spring. *Neosho*: Injured by rust and fly, and being damaged in the shock. *Reno*: All cut; not as heavy as expected. *Wabaunsee*: The best crop ever harvested, in yield and quality.

CALIFORNIA.—*Contra Costa*: Will be the largest crop harvested in this State. *Yuba*: Good, with increase over last year. *Santa Clara*: Promising a fair harvest.

OREGON.—*Linn*: Injured by wet weather.

DAKOTA.—*Devon*: Suffered from drought; with deep plowing, and drilled five or six inches deep, does well. *Buffalo*: Suffering from severe drought.

MONTANA.—*Jefferson*: Will be greatly reduced by grasshoppers.

NEW MEXICO.—*Taos*: Half destroyed already by grasshoppers.

SPRING-WHEAT.

This crop, according to our July returns, shows about 85 per cent. of an average condition. It has improved or held its own since June 1 in all the New England States except Connecticut. In New York it improved to full average, while in Pennsylvania it fell below. The culture of spring-wheat is reported at several points in the South, but it is of too inconsiderable importance to attract statistical inquiry. In the States north of the Ohio River it has fallen off, as also in the States west of the Mississippi, except Kansas, in which it has considerably advanced. Highland, Ohio, reports the Odessa as the most promising spring-wheat ever sown in that county. Several counties complain of chinch-bugs, others of excessive rains, and still others of drought. The grasshopper and Hessian fly also did some local injury. On the Pacific coast late rains have improved the crop, which is above average in California, and nearly average in Oregon. Reports from the Territories show the ravages of grasshoppers in several sections.

MAINE.—*Oxford*: Looking well. *Cumberland*: Promising.

VERMONT.—*Caledonia*: Looking well.

TEXAS.—*Gillespie*: Injured by late frost and drought; not more than 3 or 4 bushels per acre.

TENNESSEE.—*Monroe*: Almost ruined by rust.

OHIO.—*Delaware*: Never better. *Highland*: The Odessa wheat promises better than any other variety ever introduced here.

MICHIGAN.—*Emmet*: Looks very fine. *Iosco*: Greatly increased acreage. *Leelenaw*: Never more promising. *Mason*: Looks very well.

ILLINOIS.—*Ogle*: Injured by chinch. *Putman*: Almost ruined by rust. *Schuyler*: Good growth, but badly rusted. *Winnebago*: Very poor. *Mason*: Poor. *Carroll*: Thin stands and sickly appearance. *Lee*: Thin and light stands.

WISCONSIN.—*Dunn*: Spring sowing delayed by excessive rains. *Dodge*: Crops look well. *Douglas*: Seeding delayed by cold spring. *Grant*: Threatened by chinch. *Outagamie*: Looks well; abundant rains; bottom crops inundated, but high-land crops greatly benefited by the abundant rains. *Walworth*: Injured by chinch. *Monroe*: Small grain, fine. *Washington*: Injured by chinch. *Green*: Chinch bad.

MINNESOTA.—*Blue Earth*: Injured by extreme hot and dry weather; red rust prevailing. *Fillmore*: More rain of late, but the effects of drought still visible. *Lyon*: Drought, but rain at last. *McLeod*: Thinned and shortened by drought on old land; on new land, deep plowed, the crop is abundant. *Mower*: Great improvement in ten days; crop three-fourths average; good rains of late. *Sibley*: Crop the best yet raised here. *Steele*: Irregular; injured by May freshets and subsequent drought. *Wabasha*: Injured by heavy rains following drought; wheat stooled but little, and is now very thin. *Waseca*: Shortened by drought; some reports of Hessian fly. *Watomean*: Grasshoppers, Hessian fly, and drought injurious. *Winona*: Thin, but looks well. *Redwood*: Damaged by drought and grasshoppers; half crop. *Stearns*: Crop, average. *Wright*: Good on prairie, but injured on timber-land by drought. *Meeker*: Greatly injured by drought. *Faribault*: Injured by heat and drought. *Goodhue*: Outlook not flattering, especially old fields.

IOWA.—*Cherokee*: Saved by late rains. *Clinton*: Many fields very thin; not worth harvesting. *Des Moines*: Too much rain. *Hancock*: Continued drought in May very injurious; some reports of Hessian flies. *Hardin*: Some unknown influence for evil. *Howard*: Something unknown operating against the crop. *Humboldt*: Generally poor. *Jackson*: Injured by fly, chinch, and rust. *Johnson*: Thin crop from imperfect seed, and chinch. *Madison*: Injured by drought. *Mahaska*: Looks very badly; poor seed and other causes. *Marion*: Unpromising; chinch, rust, and blight. Much of it has been plowed up. *Marshall*: Puny, but improving; not stalks enough for over half a crop. *Mitchell*: Half crop; rust and fly. *Tama*: Very thin, and some turning yellow; fly at work at the joints. *Franklin*: Injured by drought. *Audubon*: Drought very destructive. *Clay*: A few fields injured by the fly. *Jefferson*: Scarce worth harvesting. *Monona*: Serious injury from drought. *O'Brien*: Extremely dry. *Washington*: Looks bad. *Woodbury*: Looks very fine.

KANSAS.—*Chase*: Improved 15 per cent. in June. *Lincoln*: Drying up, and plenty of chinch working on it. *Republic*: Very weedy.

NEBRASKA.—*Cuming*: Short straw, but healthy, and a prospect of a good yield. *Lancaster*: That sowed previous to April 20 is in splendid condition. *Stanton*: Injured by smut. *Antelope*: Good, but the weather too dry. *Dodge*: Recent rains will insure a crop of good quality, though not average in yield. *Platte*: Short straw, but the yield may be greater than last year. *Douglas*: Thin stand and short straw, owing to early dry weather.

CALIFORNIA.—*Yuba*: Much better than usual, owing to late rains.

OREGON.—*Linn*: Splendid. *Clackamas*: Looks well considering the lateness of the sowing.

DAKOTA.—*Hanson*: Suffering from drought. *Richland*: Cut off 50 per cent. by long drought and young grasshoppers.

MONTANA.—*Jefferson*: Will be greatly reduced by grasshoppers.

NEW MEXICO.—*Taos*: Half destroyed already by grasshoppers. *San Miguel*: Owing to ravages of grasshoppers a great deal has been plowed up and planted with corn. All kinds of insects bad, owing to the dry weather.

RYE.

Winter-rye is full average in New England as a whole, and spring-rye somewhat above. The Middle States cultivate but little spring-rye. The winter-grain improved during June, though drought in New Jersey still leaves its impress upon the crop. In the Southern States only winter-rye is raised, and that in no large quantity. The South Atlantic States are about average, and the Gulf States considerably below. In the southern inland States winter-rye ranges from 83 in Arkansas to 109 in West Virginia, Tennessee, and Kentucky, being nearly average. North of the Ohio River spring-rye re-appears in increasing quantities, and is above average in Michigan and Wisconsin, but considerably below in the other States. Winter-rye is above average in Michigan, and below in all the other States. West of the Mississippi River, in Minnesota and Iowa winter-rye is below average and in the other States above. In the southern portions of this section rains are reported as injuring the standing crops with rust, and as spoiling the harvested crops in the shock. Spring-rye is about average on the whole. The crop is about average on the Pacific coast.

NEW YORK.—*Westchester*: Splendid. *Saratoga*: Very irregular, and heads small. *Washington*: Winter-rye never poorer; spring, average.

PENNSYLVANIA.—*Indiana*: Good. *York*: Large crop. *Bedford*: Very good in the northern part.

MARYLAND.—*Caroline*: Well filled.

VIRGINIA.—*Madison*: Very good. *Highland*: Never better.

SOUTH CAROLINA.—*Orangeburgh*: Harvested; 110.

GEORGIA.—*Towns*: Best for years.

ALABAMA.—*Lauderdale*: Almost a failure.

TEXAS.—*Medina*: Curtailed by a drought of two and a half months.

ARKANSAS.—*Izard*: Now in the shock; will make a small yield.

WEST VIRGINIA.—*Pendleton*: Very good.

KENTUCKY.—*Spencer*: Short yield but fine quality. *Mason*: Increased acreage and very fine.

MICHIGAN.—*Mason*: Looks very well.

INDIANA.—*Martin*: Endangered by rains in harvest.

ILLINOIS.—*Sangamon*: Spoiling in the shock. *Mason*: Looks well.

MISSOURI.—*Cass*: The best crop for many years. *Caldwell*: Ready to cut, but we cannot get into the fields for wet. *Clay*: Fine, but endangered by rains.

KANSAS.—*Jackson*: Never better.

OATS.

The oats-crop improved during June in most of the States. Rhode Island reports a large falling off, but this is more than counterbalanced by the large increase in the other New England States. The drought injured the crop in some localities during the latter half of June. The Middle States have risen above average, except Delaware, in which the previous low June condition was still further reduced. The South Atlantic States, except Maryland and Georgia, fell off during June, but the condition of the whole is considerably above average. The Gulf States about held their own, and are a little above average. Of the Southern inland States, all except Arkansas report an improved condition, yet they are still below the average. The States north of the Ohio River all improved during June, and are a full average on the whole. West of the Mississippi River, Kansas shows a marked improvement, reaching 108, but all the other States of this section declined in condition and are below average. The Pacific States are above average, California having maintained her June condition, and Oregon having improved hers. It will be observed from the following notes that public opinion in the South is settling down decidedly in favor of winter-crops of oats. In some parts of the Northwest rust affected the crops of some counties.

The crop of the whole country, taken together, is about average.

MAINE.—*Oxford*: Promise well.

VERMONT.—*Caledonia*: Looking well.

MASSACHUSETTS.—*Bristol*: Somewhat injured by dry weather in the latter half of June.

NEW YORK.—*Albany*: Very good. *Otsego*: Looks finely. *Genesee*: Somewhat injured by drought. *Saratoga*: The early-sown doing finely. *Oswego*: Better than usual. *Erie*: Need rain badly.

NEW JERSEY.—*Warren*: Suffering for the want of rain.

PENNSYLVANIA.—*Perry*: Prospect of full crop. *Indiana*: Doing finely. *Armstrong*: Late, and somewhat injured by drought the last of May. *Beacer*: Have suffered from drought. *Union*: Looks well. *Elk*: Splendid.

MARYLAND.—*Caroline*: Looks well. *Howard*: Unusually good. *Wicomico*: A good crop on high land; on low land, thin, but of good quality. *Baltimore*: Fine; another rain will make a heavy yield.

VIRGINIA.—*Caroline*: Favorable season. *Madison*: Better than usual. *Warwick*: A good crop of winter-oats harvested; spring-oats much injured by rust. *Chesterfield*: Spring-oats very poor. *Powhatan*: Winter-oats exceedingly heavy; spring-oats scarcely worth reaping. *Fluvanna*: Very poor. *King George*: Have risen from a most unpromising condition to a full crop. *Orange*: Have suffered from drought. *Prince William*: Thin stands, but the heads large and well filled. *Spotsylvania*: Promise well. *Campbell*: Very inferior. *James City*: Fall-oats first rate; spring came up badly, but have branched unusually well. *King and Queen*: Very fine. *Prince Edward*: The crop will

be somewhat shortened by the dry weather. *Hadifar*: Fall-oats poor; spring injured by frost and rust. *Charles City*: Fall-oats good; spring destroyed by frost and drought. *Highland*: Never better. *Norhampton*: Seriously injured by fly and rust.

NORTH CAROLINA.—*Alamance*: Winter-oats good, but spring-oats bring the whole crop below an average. *Wilson*: Winter, good; spring, medium. *Camden*: A good crop housed. *Darrie*: Thin, owing to cold weather in March. *Hertford*: Spring-oats injured by rust. *Caldwell*: Injured by excessive rains.

SOUTH CAROLINA.—*Clarendon*: A heavy yield; all harvested in good condition. *Chester*: Damaged 10 per cent. by excessive rain for six days. *Newberry*: The yield abundant, and most of the crop has been harvested without damage. *Lexington*: Never better; housed in good condition. *Orangeburgh*: Harvested; 130. *Laurens*: The best for ten years.

GEORGIA.—*Dooly*: Large acreage, and the best yield ever known. *Elbert*: Continued rains for a week in harvest have injured the crop. *Gordon*: Fall-oats extra good. *Marion*: Never better. *Thomas*: Good, and housed in good condition. *Troup*: Fall-oats fine; spring, a total failure from rust. *Upson*: The finest ever grown. *Worth*: A large acreage harvested, and the best crop ever seen. *Gwinnett*: Fall, above average; spring, injured by rust 33 per cent. or more. *Baldwin*: The acreage estimated by good judges at 400, and the condition 150. *Cherokee*: The Holstein oats from the Department made a fine yield. *Clayton*: Both fall and spring very good, though somewhat injured by rust. *Columbia*: Becoming a drag in the market. *Hancock*: Very fine. *Henry*: Good. *Randolph*: Very good crop harvested. *Richmond*: Fully 125 in acreage and 125 in condition, but injured by the excessive rains. *Coneta*: Fall-oats are good, especially red rust-proof. One farmer made 115 bushels on one acre; another, 377 bushels on seven acres; and a yield of 60 to 90 bushels per acre is common. *Jefferson*: Unusually large and good crop. *McDuffie*: The best crop in quantity and quality ever raised in Georgia by far. *Cobb*: Harvested; fall-oats, the best ever raised; spring, almost a failure from rust. *Walton*: Both winter and spring oats excellent. *Wilcox*: All housed and a good yield. *Jackson*: A good crop. *Lincoln*: Large individual losses by the flood sweeping off the stacks from the bottoms, and considerable damage by sprouting in the shock. *Fulton*: Slightly damaged by rust, but full quantity, owing to increased acreage.

FLORIDA.—*Madison*: More planted than ever before, and never better. *Leon*: All housed, and a splendid yield. *Gadsden*: Increased acreage harvested in good condition, and the yield considerably above average.

ALABAMA.—*Greene*: Rusted badly. *Crenshaw*: All rust-proof oats good. *Calhoun*: Very fine. *Barbour*: Spring oats generally a failure, but owing to the large area of winter rust-proof, the yield is good. *Lauderdale*: Heavy and good. *De Kalb*: Materially damaged by rust, the rust-proof only escaping.

MISSISSIPPI.—*Grenada*: The Holstein oats from the Department suffered a little from rust, but will make a fine yield. *Perry*: Not over half a crop, owing to rust and a cold spring. *Clarke*: Harvested, and a very good yield. *Cherokee*: Have done well. *Lincoln*: Housed in good condition; decreased yield made up by increase in acreage. *Winston*: The Holstein oats a failure; the rust took them and they fell down.

TEXAS.—Harvested, and a heavy yield. *Panola*: Spring oats nearly all ruined by rust. Fall oats, rust-proof, very fine; all harvested. *Upshur*: Harvested; 25 per cent. above last year. *Williamson*: Large acreage, immense yield, and good quality. *Caldwell*: Acreage 200 and yield 150. *Medina*: Curtailed by a drought of two and a half months. *Red River*: Rusted badly. *Barleson*: Yield good—as high as 75 bushels per acre; average 40 bushels. *Collin*: Damaged by rust. *Dallas*: Harvested; 40 bushels per acre. *Smith*: Rains favorable for the crops. *Shelby*: Badly damaged by rust; the red oats average. *Titus*: Acreage large, and the yield never better; red rust-proof sown. *Bezar*: Will average 40 bushels per acre. *Burnet*: Rusted. *Cooke*: Whole fields ruined by flood. *Fannin*: About 60 bushels per acre.

ARKANSAS.—*Boone*: Badly damaged by rust. *Cross*: Damaged by rains. *Saint Francis*: Rusted to some extent. *Baxter*: Not quite as good as last year. *Crawford*: Injured by early drought. *Yell*: Damaged by rust. *Clay*: Injured by rust. *Franklin*: Injured by rust. *Bradley*: Red, rust-proof, a fair yield; all other kinds almost worthless from rust. *Izard*: Better than wheat and rye. *Fulton*: Early-sown, good; late, injured by rust. *Marion*: Rusted badly.

TENNESSEE.—*Decatur*: Some rust. *Blount*: Rust threatens a failure. *Monroe*: Good. *James*: A large and good crop raised and cut. *Bradley*: Injured by rain in harvest. *Giles*: Being cut; unusually good. *Meigs*: Nearly ruined by rust. *Robertson*: Low, and injured by rust. *Macon*: Injured by rust. *Greene*: Fall oats splendid; spring, not good.

WEST VIRGINIA.—*Tucker*: Will be short, owing to drought. *Pocahontas*: Fine prospect. *Monroe*: Better than for many years. *Wetzel*: Materially injured by dry weather. *Doddridge*: Not more than half a crop.

KENTUCKY.—*Ohio*: Almost ruined by rust. *Pendleton*: Not good. *Taylor*: Taking rust. *Bath*: Decidedly improved by rains. *Mason*: Have improved wonderfully un-

der showers, and promise a good crop. *Owsley*: Rusted badly. *Russell*: Destroyed by rust. *Shelby*: Show good heads, but many fields too short to cut, owing to drought. *Lewis*: Short in stem but plump. *Hardin*: Some rust.

OHIO.—*Adams*: Very short; many fields will not make half a crop. *Lorain*: A large growth, and early. *Perry*: Quite short; early spring, very dry. *Lucas*: Being injured by wet weather. *Hancock*: Overgrown.

MICHIGAN.—*Wexford*: Early-sown never so good. *Calhoun*: Very luxuriant. *Emmett*: Look very fine. *Iosco*: Greatly increased acreage. *Barry*: Rusting. *Tuscola*: Looking splendid. *Mecosta*: Retarded by excessive rains.

INDIANA.—*Brown*: Rusting badly. *Decatur*: Tall and heavy. *Fayette*: Slightly affected with rust. *Hamilton*: A large crop, looking finely. *Martin*: Rusted badly, and threatened with ruin by rain in harvest. *Noble*: Good. *Clark*: Short stalk, but well headed.

ILLINOIS.—*Crawford*: Rusting. *Effingham*: Damaged by too much rain. *Saint Clair*: Good. *Mason*: Look well. *Madison*: Rather short, and affected by rust.

MINNESOTA.—*Sibley*: Finest crop yet raised. *Wright*: Short, and rusting.

MISSOURI.—*Chariton*: Suffered from early drought. *Carter*: In many places will be worthless from rust. *Douglas*: Badly damaged by rust. *Jasper*: Badly killed with rust. *McDonald*: Injured by rust. *Mississippi*: Very much damaged by the continued rains. *Pettis*: Not nearly so heavy as last year. *Ralls*: Short. *Saint Charles*: Very short, owing to drought in May. *Stone*: Nearly destroyed by rust. *Clay*: Fine, but endangered by rains. *Maries*: Thin, and symptoms of rust. *Perry*: Look well, but threatened with rust.

KANSAS.—*Bourbon*: Look well, except that they are badly rusted. *Chase*: Extra. *Lafayette*: Thin and short; too much rain. *Lyon*: Rusted to some extent. *Wabaunsee*: Never any crop like it seen in this section; many fields are estimated to yield 75 bushels per acre.

NEBRASKA.—*Antelope*: Good, but too dry weather.

OREGON.—*Clackamas*: Considering the lateness of sowing, look well.

DAKOTA.—*Devon*: Suffered from drought. *Buffalo*: Suffering from severe drought. *Harmon*: Suffered from drought.

MONTANA.—*Jefferson*: Are taking the place of wheat.

NEW MEXICO.—*Taos*: The crop has escaped the grasshopper to some extent; but it is doubtful if it will, after they have finished the wheat.

BARLEY.

Winter-barley is grown only in the central latitudes to any extent; but small portions are grown in the South; while in the more northern States the spring-growing alone is reported. In New England, New York, Michigan, and Oregon, spring-barley is above average, and in other States within the same parallels it is below. In the belt next southward, Ohio and California are above average, and other States from 1 to 17 per cent. below. Of winter-barley, Texas, Kentucky, Wisconsin, Kansas, Nebraska, and California are above average, and all other States below. Chinchies have injured it in some parts of Kansas. In Dakota it appears to stand drought better than either wheat or oats.

NEW YORK.—*Albany*: Very good. *Otsego*: Look finely. *Genesee*: Somewhat injured by drought. *Erie*: Needs rain badly.

PENNSYLVANIA.—*York*: A large crop.

TEXAS.—*Caldwell*: Acreage, 200; yield, 150. *Dallas*: Harvested; 40 bushels per acre. *Fannin*: About 50 bushels per acre.

KENTUCKY.—*Mason*: Very fine, and all harvested in good order.

OHIO.—*Miami*: Mostly harvested in splendid condition.

MICHIGAN.—*Calhoun*: Very luxuriant.

ILLINOIS.—*Ogle*: Injured by chinchies. *Winnebago*: Very poor. *Carroll*: Thin stand, and sickly appearance.

MINNESOTA.—*Sibley*: Finest crop yet raised.

KANSAS.—*Lincoln*: Drying up, and plenty of chinchies working on it.

CALIFORNIA.—*Contra Costa*: The crop will be the largest harvested in this State. *Yuba*: Has turned out well. *Santa Clara*: A small crop.

DAKOTA.—*Hanson*: Stood the dry weather better than wheat and oats.

PASTURES.

The superior condition of pastures reported the 1st of June is fully maintained. Drought has reduced the average in New Jersey to 85, dry weather in Minnesota to 99, and Rhode Island returns an average of 95; but in all the other States the average ranges from 100 upward—reaching in Arkansas 114; Michigan, 112; Illinois, Wisconsin, and Oregon, 110; Maine, 109; Vermont, Texas, Kentucky, and Ohio, 108; Delaware, North Carolina, and Kansas, 107; West Virginia, Indiana, and Missouri, 106; New Hampshire, New York, Alabama, Louisiana, and Iowa, 105.

MAINE.—*Oxford*: Good.

MASSACHUSETTS.—*Bristol*: Injured by dry weather, except on low lands.

CONNECTICUT.—*New London*: Suffering from dry weather.

NEW YORK.—Not as good as last year. *Westchester*: Suffering from dry weather. *Olsego*: Luxuriant. *Suffolk*: Shortened by dry weather.

NEW JERSEY.—*Gloucester*: Injured by severe drought. *Warren*: Very short, from drought.

PENNSYLVANIA.—*Indiana*: Prime. *Armstrong*: Good. *Beaver*: Have suffered from drought.

MARYLAND.—*Caroline*: Never better. *Howard*: Very good.

VIRGINIA.—*Chesterfield*: Short from dry weather. *Orange*: Have suffered from drought. *Dinwiddie*: Drying up. *Charles City*: A severe drought for four weeks has burned up the pastures.

NORTH CAROLINA.—*Haywood*: Better than for many years.

GEORGIA.—*Walton*: Excellent. *Carroll*: Good.

ALABAMA.—*Lauderdale*: Never better.

MISSISSIPPI.—*Perry*: Better than last year 10 per cent. *Jefferson*: Poor; too dry.

LOUISIANA.—*Jackson*: Very superior.

TEXAS.—*Williamson*: Never better; cattle fat. *Red River*: Better than for years. *Bee*: A great many pastures being inclosed, and improved stock being imported from Kentucky and other places. *Dallas*: Very good. *Titus*: Acreage large, and the condition never better. *Washington*: Excellent, and stock of all kinds thrifty and fat. *Travis*: Never better; native grass abundant.

TENNESSEE.—*Gibson*: Never better. *Monroe*: Never better. *Sevier*: Better than ever before. *Bradley*: Never better. *Giles*: Never better. *Polk*: Excellent. *Greene*: Never better.

WEST VIRGINIA.—*Pocahontas*: Thick set and luxuriant. *Braxton*: Very good. *Pendleton*: Never better.

KENTUCKY.—*Spencer*: Heavily covered with white clover. *Russell*: Splendid.

OHIO.—*Ashtabula*: Good; this is a cheese-making county, on the factory system, and a full average will be manufactured. *Lorain*: Excellent. *Portage*: The white clover whitening thousands of acres. *Jackson*: Extra good. *Hancock*: Never better.

MICHIGAN.—*Emmett*: Very fine. *Mason*: Look very well. *Mecosta*: Abundant.

INDIANA.—*Decatur*: Good.

ILLINOIS.—*Hardin*: Never better.

MISSOURI.—*Chariton*: Good. *Stone*: Fine. *Clay*: Good, but not fully restored from the effects of the grasshoppers last year. *Harrison*: Fine.

CALIFORNIA.—*Sonoma*: Better than for twenty-five years.

COLORADO.—*El Paso*: The prairies never looked more promising.

UTAH.—*Morgan*: More pasturage on the hills than for many years. *Kane*: Feed on the ranches drying up for want of rain.

MONTANA.—*Jefferson*: Very fine, owing to the wet season.

THE GRASS-CROP.

The clover-crop improved during June in nearly all the Atlantic and Gulf coast States, declined in nearly the whole of the Mississippi Valley, and improved on the Pacific slope. Maine, Vermont, Massachusetts, New Jersey, Pennsylvania, Wisconsin, Minnesota, and Iowa are from 1 to 10 per cent. below average, the minimum being in Minnesota. The other States are all above average, the maximum, 111, being in South Carolina and Tennessee. Timothy makes a still more favorable showing. The only States below average are Maine, New Hampshire,

Vermont, Connecticut, New Jersey, Kentucky, Minnesota, and Nebraska, the minimum, 86, being in the last-named State. All the other States are above average, the maximum, 109, being in Oregon. The hay-crops will be ample for the necessities of the year.

MAINE.—*Penobscot*: Will be heavy. *Waldo*: Grass first-rate. *Piscataquis*: Good prospect of a bountiful crop. *Oxford*: Clover winter-killed in many places; timothy seems to suffer from too much moisture. *Franklin*: Very promising. *Cumberland*: Will be abundant.

NEW HAMPSHIRE.—*Hillsborough*: Abundant. *Rockingham*: The prospect not so good as last year.

VERMONT.—*Rutland*: Light. *Caledonia*: Clover badly winter-killed; other grass looking finely. *Orleans*: Indications of a light crop.

CONNECTICUT.—*New London*: Timothy somewhat affected by dry weather.

NEW YORK.—*Dutchess*: Clover and timothy reduced by drought. *Otsego*: Meadows promise well. *Warren*: Will not be average; June, too dry. *Washington*: Timothy never looked poorer. *Suffolk*: Shortened on all old mowing grounds by dry weather. *Erie*: Not as heavy a growth of clover and timothy as last year. *Richland*: Short, owing to dry weather. *Allegany*: A larger crop never seen.

NEW JERSEY.—*Sussex*: Will be a good crop; some already secured in good condition. *Warren*: Clover very short and thin; timothy not as heavy and thick as was anticipated, owing to drought.

PENNSYLVANIA.—*Cameron*: Excellent. *Indiana*: Clover and timothy are all that could be wished. *York*: The early or first crop a good one and now housed. *Armstrong*: Meadows good; growing fast as they can. *Union*: Haymaking nearly over, and a heavier crop than for several years. *Tioga*: The heaviest crop in twenty years. *Elk*: Will be the largest crop in five years.

MARYLAND.—*Caroline*: A large crop of clover and timothy. *Howard*: Clover and timothy very good. *Harford*: Promise of a very good crop. *Baltimore*: A heavy crop of rather coarse clover; hay secured.

VIRGINIA.—*Madison*: Timothy above average and clover better than for many years. *Russell*: Clover, timothy, and other grasses very good. *Chesterfield*: Timothy injured by dry weather through June; clover short, but nicely cured. *Powhatan*: A fine yield of clover and timothy. *Fluvanna*: Clover, timothy, and other grass very good. *Orange*: The hay crop has suffered from drought. *Spottsylvania*: The hay-crop is very large throughout the county. *Campbell*: An abundant hay-crop. *Dinwiddie*: Clover has been seriously affected by the dry weather. *Charles City*: Clover burned up by a severe drought for the past four weeks. *Highland*: The heaviest crop of hay for many years.

NORTH CAROLINA.—*Alamance*: Clover-crop not so good as usual.

SOUTH CAROLINA.—*Lawrens*: Much German millet has been sown, and looks luxuriant; clover cut and better than usual.

GEORGIA.—*Baldwin*: Clover and Italian rye-grass barely introduced; both promise well on a small scale. *Walton*: Our farmers are giving grasses some attention and they promise well. *Fulton*: Fine yield of clover.

TEXAS.—*Bowie*: Small patches of clover sown last year are yielding an abundant crop. *Williamson*: Grass never better. Millet and Hungarian grass raised for forage. *Collin*: Alfalfa fine. *Titus*: Acreage of clover, timothy, and blue-grass rapidly increasing and doing finely.

TENNESSEE.—*Lincoln*: The clover-crop never better. *Gibson*: Clover and timothy very luxuriant. *Monroe*: Clover very fine and timothy good. *Rhea*: A good season for grass. *Sullivan*: Clover and timothy excellent. *James*: Clover fine; too much rain for hay-making. *Serier*: Clover better than ever before. *Bradley*: Clover, timothy, and red-top exceedingly fine. *Greene*: Clover very extra and timothy above average.

WEST VIRGINIA.—*Tucker*: Grass will be short owing to drought. *Pocahontas*: Clover excellent and timothy very good. *Braxton*: Clover and timothy good. *Grant*: Meadows very good. *Pendleton*: Meadows never better. *Monroe*: More grass for hay than grew last year and year before.

KENTUCKY.—*Spencer*: Abundant rains have improved the grass very much. *Russell*: Meadows splendid. *Hardin*: Clover looks well and timothy good but for the white-blossom. *Callaway*: Clover, timothy, and herd's-grass never better.

OHIO.—*Lorain*: Meadows never better. *Portage*: Have not seen meadows, old and new, looking so well in twenty years. *Wood*: About half the clover spoiled on the ground. *Defiance*: The crop of clover cannot be saved owing to excessive rains. *Licking*: Hindered somewhat by rains in saving the crop. *Lucas*: A large growth of clover; some of it rotting, cut and uncut, owing to excessive rains. *Miami*: Grasses of all kinds never so good. *Wayne*: Clover heavy and down. *Hancock*: Clover and timothy superabundant. *Muskingum*: Large quantities of clover mowed and ruined on the ground by heavy rains.

MICHIGAN.—*Wayne*: Much clover cut, but, owing to continuous rains, but little secured in good condition. *Wexford*: Clover and timothy never better. *Delta*: Grass extra good. *Lenawee*: Clover heavy and rotting. *Calhoun*: Injured by continuous heavy rains; timothy very luxuriant. *Hillsdale*: Bad time for haying; very wet. *Iosco*: Grass of all kinds trying to overdo itself. *Washtenaw*: Very heavy crop, but too wet to secure it. *Allegan*: Gone past its time for cutting, owing to rain for the past fifteen days. *Barry*: Very wet—bad for saving hay. *Mecosta*: Never better.

INDIANA.—*Lake*: No haying can be done owing to continual rains for three weeks past, and clover, which ought to be cut, is being injured. *Decatur*: Clover is good, but the rains prevent cutting and curing. *Carroll*: The wet weather has already destroyed a considerable portion of the clover-hay. *Dearborn*: The low estimate of timothy, 75, is due to the enormous growth of white-weed. The meadows in this part of the State are white with its blossoms. *Hamilton*: Timothy extra good. *Hendricks*: Clover cannot be cut owing to continued rains. *Kosciusko*: Hundreds of tons of clover will rot on the fields, and more in the stack. *Martin*: Clover and grass cannot be cut for the rains. *Wells*: Impossible to make clover-hay owing to wet weather. *Whitley*: Much rain makes it hard for hay-making.

ILLINOIS.—*Hardin*: Meadows never better. *Menard*: Clover and the grasses are rotting from the effects of wet weather; timothy as fine as ever grew. *Mercer*: Grasses remarkably good. *Saint Clair*: Prospect for a fine crop of grasses never better. *Saint Clair*: Timothy, clover, and other grasses good and plenty; clover never harvested in better condition. *Shelby*: Clover being ruined for want of fair weather to make it.

WISCONSIN.—*Walworth*: Grass-crops largely winter-killed; old meadows light. *Monroe*: Grass-crops fine.

IOWA.—*Clinton*: Grass-crops of all kinds very good. *Mahaska*: Large quantities of Hungarian grass sown, owing to failure of wheat.

MISSOURI.—*Chariton*: Clover and timothy, which suffered from early dry weather, improved by recent rains. *Adair*: Hay-crop will be short, owing to the May drought. *Johnson*: Young clover and timothy look well. Little clover and no timothy escaped the grasshopper last year. *Saint Charles*: Very short, owing to drought in May. *Stone*: Clover and timothy fine. *Clay*: Timothy good, but clover scarce and poor.

KANSAS.—*Douglas*: Grass was never better. *Republic*: Very little clover sown, but that is growing finely.

CALIFORNIA.—*Santa Clara*: The hay-crop is at least 50 per cent. greater than in any former year, and it is chiefly of good quality. *Sonora*: Grass better than for twenty-five years. A vast increase in the acreage of alfalfa.

OREGON.—*Multnomah*: The rainy spring has greatly favored meadows. *Linn*: The hay-crop will be of unusual excellence.

WASHINGTON.—*Thurston*: The hay-crop abundant, but will be injured by rot, being badly lodged.

POTATOES.

The acreage planted in potatoes in 1876 is about 8 per cent. less than in 1875. The States equaling or exceeding last year's acreage are Maine, 100; Delaware, 100; North Carolina, 103; South Carolina, 101; Georgia, 102; Alabama, 101; Texas, 136; Arkansas, 106; Tennessee, 101; Minnesota, 100; Missouri, 125; Kansas, 112; California, 110; Oregon, 108. The greatest reductions were New Jersey, 31 per cent.; New York, 15 per cent.; Rhode Island, 12 per cent.; and Ohio, 11 per cent. The general reduction in the northern and central parts of the Atlantic slope was doubtless due to the visitation of the Colorado beetles. In those States below the range of that pest there has been an increased acreage. In the States north of the Ohio River, and in West Virginia and Kentucky, there has been a general falling off. But in the States west of the Mississippi and on the Pacific slope there has been a marked increase, except in Iowa and Nebraska, which have somewhat reduced their acreage.

The condition of the crop does not present as marked variations as in former years. The highest State average, 107, is in Georgia, and the lowest, 84, is in Louisiana. New Jersey, 87, is especially troubled with drought and Colorado beetles, and in Connecticut, 85, the conditions of growth have been unfavorable. The New England and Middle States as a whole are below average, but all the other sections are full average

or slightly above. The following notes from our statistical correspondence illustrate the local variations of condition :

MAINE.—*Piscataquis*: Decreased acreage. *Cumberland*: Promising.

NEW YORK.—*Albany*: Look well; but the beetles are here. *Westchester*: Many acres ruined by the beetle. *Dutchess*: Injured by the beetle. *Otsego*: Overrun with beetles. *Genesee*: Diminished acreage, owing to low prices. *Saratoga*: Less acreage through fear of the beetle; the crop badly injured by it in some localities. *Columbia*: Being injured by the beetle to some extent. *Orange*: The prospect materially affected by the ravages of the beetle. *Suffolk*: The beetle ravaging the crop. *Yates*: Doing nicely, except where taken by the beetle. *Kings*: Much injured by the beetle. *Richland*: The beetle would destroy all if let alone.

NEW JERSEY.—*Gloucester*: Greatly injured by drought. *Sussex*: About half the acreage of last year; will be a good crop where the beetle has been fought with Paris green. *Warren*: Look well where the beetle has been kept off.

PENNSYLVANIA.—*Cameron*: Look well. *Clearfield*: Small acreage, but look well. *Indiana*: Excellent. *Bucks*: Acreage decreased 25 per cent. on account of the beetle, and that will shorten the crop planted. *Delaware*: Show well. *Union*: Promise of a good crop.

MARYLAND.—*Howard*: Small acreage on account of the beetle. *Chesterfield*: Early Rose very fine in size and quality. *Baltimore*: Indications of a fine crop.

VIRGINIA.—*Orange*: Early will be very short owing to drought. *Elizabeth City*: Early turn out better than last year, and command a better price.

NORTH CAROLINA.—*Hertford*: Excellent. *Caldwell*: Injured by excessive rains.

SOUTH CAROLINA.—*Colleton*: Never better.

GEORGIA.—*Hancock*: Very fine. *Haralson*: Two weeks late, but looking well. *Jefferson*: Unusually large and good crop. *McDuffie*: A dry May and wet June have been the life of the crop. *Walton*: Good.

FLORIDA.—*Jackson*: Short. *Gadsden*: The acreage was increased fully 300 per cent., but the condition is 25 per cent. below average.

ALABAMA.—*Lauderdale*: A good crop; all made.

MISSISSIPPI.—*Perry*: Better than last year 10 per cent.

TEXAS.—*Harrison*: Doubling our crop. *Upshur*: Better than last year. *Burleson*: Cut short by drought in April and May.

TENNESSEE.—*Gibson*: Come up badly; too much wet weather. *Loudon*: Extra fine. *Polk*: Excellent. *Greene*: Very promising.

WEST VIRGINIA.—*Grant*: The old black-striped potato-beetle has again appeared in large numbers. *Monroe*: Fine. *Wetzel*: Materially injured by dry weather.

KENTUCKY.—*Lewis*: Short, owing to dry weather.

OHIO.—*Adams*: Look well. *Portage*: Promise to be plenty as last year. *Washington*: A large crop planted; look well. *Defiance*: Damaged by excessive rains. *Lucas*: Bugs and weeds are thriving better than potatoes.

MICHIGAN.—*Ottawa*: Too much rain. *Muskegon*: Suffering on heavy lands from excessive rains.

INDIANA.—*Clarke*: Very good. *Madison*: Look well.

KANSAS.—*Lyon*: Rotting. *Montgomery*: Acreage, 338. *Reno*: Extra good.

NEBRASKA.—*Antelope*: Too dry. *Dodge*: Doing well.

OREGON.—*Clackamas*: Considerably injured by late rains, and very backward.

UTAH.—*Kane*: All early potatoes were cut down by the frost of May 17.

DAKOTA.—*Buffalo*: Suffering from drought and ravages of the beetle.

SWEET-POTATOES.

In nearly all the States reporting this crop the acreage has been increased, while in the others the decline has been but small. The largest increase, 14 per cent., is noted in Georgia and Kansas, and the greatest decline, 9 per cent., in Ohio. Pennsylvania has fallen off 1 per cent. and Indiana 2 per cent. All the other States show a decided increase, making a net increase on the whole of about 6 per cent. The condition of the crop is above average on the whole, but the range of variation is very narrow. The maximum, 109, is in Texas, and the minimum, 94, in Louisiana. The large-producing States are all full average, or a little above, while the deficiencies of the few low-average States are very small. The present indications point to a very fair crop in all States where this plant is grown.

VIRGINIA.—*Chesterfield*: Large acreage, planted in good time, and looking well. *Northampton*: Cannot expect more than 75 per cent. of a crop, owing to diseased plants and fleas.

NORTH CAROLINA.—*Wake*: Rather dry for setting the plants.

SOUTH CAROLINA.—*Clarendon*: Very promising. *Colleton*: Never better.

GEORGIA.—Very fine; acreage 200, and condition 150. *Henry*: More planted than last year by 25 per cent.; nearly all the freedmen have a patch. *Jefferson*: Unusually large and good crop. *McDuffie*: A dry May and wet June have been the life of the crop. *Walton*: Good.

FLORIDA.—*Jackson*: Will be deficient, owing to drought in May.

ALABAMA.—*Corvinton*: Unfavorable season for setting out the vines. *Crenshaw*: Fine. *Lauderdale*: Looking well. *Conecuh*: Increased acreage and more advanced than last year.

TEXAS.—*Waller*: Fine weather for the crop. *Austin*: Promise well. *Dallas*: Never better. *Washington*: Quite promising.

TENNESSEE.—*Gibson*: Doing well; fine season for setting the plants.

KENTUCKY.—*Gallatin*: Remarkably fine.

MISSOURI.—Cut short by dry weather at the time of setting out the plants.

BEANS.

The acreage in beans is equal to or greater than that of last year in all sections, except the States north of the Ohio River, in which there is a reduction of 4 to 8 per cent, but the acreage in all the States is about equal to that of last year, the deficiency in the section last named being made up by an increase elsewhere. Our returns indicate about an average condition of the crop on the 1st of July.

SORGHUM.

No returns of acreage have been received from any Atlantic State north of Maryland. In the Southern States generally, there has been an increased planting over last year, but in the Northwest, a reduction in all the States except Indiana, which reports an acreage equal to last year's. In the South Atlantic and Gulf States the condition of the crop is about average on the whole, but in the Northwest a considerable depression is noted. No culture of sorghum is reported on the Pacific coast.

VIRGINIA.—*Madison*: Larger crop than ever before planted, and looking well.

SOUTH CAROLINA.—*Edgefield*: Little patches of sorghum in all directions.

GEORGIA.—*Upson*: Area increased 20 per cent. *Troup*: Acreage, 150. *Baldwin*: Acreage, 200, and condition 150. *Hancock*: Acreage, 130; condition, 120.

ALABAMA.—*Corvinton*: Acreage increased, but still small. *Crenshaw*: Acreage and condition each 150. *Conecuh*: Increased acreage and more advanced than last year.

MISSISSIPPI.—*Amite*: Diminished acreage, with increase of Louisiana cane. *Lauderdale*: Not as good as last year. The cultivation diminishing, and Louisiana cane increasing. *Coahoma*: Our first crop, and old sugar-raisers say it looks splendid.

TEXAS.—*Upsur*: Acreage increased 50 per cent., and condition 120. *Austin*: Fine. *Burleson*: Doing well.

ARKANSAS.—*Grant*: Coming into notice slowly.

UTAH.—*Weber*: Backward, but looking well.

SUGAR-CANE.

Seven States report a greater or less acreage in sugar-cane. Of these Georgia, Florida, Alabama, Mississippi, and Texas indicate an increase of 5 to 19 per cent. over the acreage of last year. South Carolina plants 15 per cent. less and Louisiana 2 per cent. less than last year. The decrease in Louisiana is more than sufficient to counterbalance the increase in all the other States. Texas and Georgia seem to be enlarging their cane-culture very considerably.

FLORIDA.—*Jackson*: Looks well; fully up to the season. *Gadsden*: Acreage increased 20 per cent., and the condition full average.

ALABAMA.—*Crenshaw*: Good. *Concuh*: Increased acreage, and more advanced than last year.

MISSISSIPPI.—*Amite*: More extensively cultivated than ever before. *Lauderdale*: The cultivation increasing. *Pike*: More planted. *Perry*: Acreage increased 25 per cent., and the condition 10 per cent. better than last year.

TEXAS.—*Harrison*: Has been grown here successfully for a year or two, and we are doubling the crop. *Cherokee*: The mild winter started the cane, and at the planting-time many of the shoots were broken off. *Upshur*: Acreage increased 30 per cent. *Burleson*: Doing well.

COTTON.

Cotton, in the first week of July, is in a condition of healthy growth—less favorable than in July of last year—well cultivated and reasonably clear of grass. During the last half of June its growth was rapid, and blooms were freely reported in the more southern belt. No complaints of drought are received; rains have been frequent, and, in a large area, in excess of the requirements for the highest condition. In rainy districts the uplands and sandy lands give better promise at present than the bottoms. In South Carolina and in Florida storms were especially severe between June 11 and 18; in some localities, seven days of continuous rain.

In comparison with last year, North Carolina, Georgia, and Texas report higher condition; all the other States lower figures than in July of 1875. The general average of 1875 slightly exceeded 100; the present average of condition is 97.6; the unit of comparison being normal growth and unimpaired vitality.

In comparison with the report of June, the States that have made improvement are North Carolina, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Tennessee. Georgia has held the high condition of last month. South Carolina has declined from 98 to 90, in consequence of excessive moisture.

The figures for condition are as follows: North Carolina, 104; South Carolina, 90; Georgia, 103; Florida, 98; Alabama, 100; Mississippi, 94; Louisiana, 92; Texas, 99; Arkansas, 97; Tennessee, 103.

VIRGINIA.—*Dinwiddie*: The most favorable season for cotton for several years.

NORTH CAROLINA.—*Warren*: An excellent stand; generally clear of grass; backward, owing to cold nights. *Wayne*: Has been well cultivated and promises an unprecedented yield. *Cumberland*: Fully fifteen days behind. *Gaston*: Late and small, but clear of grass and healthy. *Wilson*: Healthy, free from grass, and in fine condition. *Duplin*: Better than ever known. *Pitt*: The weather in June very seasonable, and a large crop promised. *Wake*: Clean and in good condition, well advanced. *Nash*: On high and sandy lands, well advanced; on low and stiff lands, bad stand, small, and somewhat grassy. *Beaufort*: Has grown rapidly the last two weeks. *Hartford*: Early, and very promising. *Pasquotank*: Late seven to ten days, but looks well; favorable season for cultivating. *Caldwell*: Injured by excessive rains.

SOUTH CAROLINA.—*Beaufort*: Much injured by a prolonged rain-storm in June. *Clarendon*: Seven days of continuous rain proved very injurious; the leaves turned from green to red; but the past few days of warm, dry weather have given the plant a start. *Chester*: Six days of excessive rain, ending June 19, gave cotton on sandy lands the red rust, and many of the fields have become grassy, and are not yet cleaned. *Newberry*: Promises a good yield. *Georgetown*: A good stand was checked by drought in April and May; and owing to recent protracted rains, grass now has the ascendancy. *Lexington*: Backward. *Marlborough*: Very good; clear of grass and healthy. *Richland*: Much injured and destroyed by a freshet. *Barnwell*: Injured 5 per cent. by steady rain, from the 11th to the 18th of June. *Fairfield*: A week of continuous heavy rains, ending in a disastrous freshet, has done the crop great injury. *Horry*: Acreage increased 25 per cent.; eight to ten days late, and damaged badly by heavy rains from June 10 to the 20th. *Spartanburgh*: Two weeks behind in size and fruitage. *Orangeburg*: Very much injured by heavy rain-storms. *Edgefield*: Small, but good stands and vigorous plants. *Marion*: Bloomed about eight days later than last year. *Chesterfield*: Too much rain for cotton. *Laurens*: Poor stands, and backward; much destroyed by devastating rains.

GEORGIA.—*Dooly*: Fine; just beginning to form. *Elbert*: Destroyed on the bottoms by a freshet in June. *Marion*: Backward, but good stands, well cultivated, and promising. *Fannin*: Not a very good stand; killed by the bud-worm. *Thomas*: Fine. *Troup*: Prospect very good. *Baldwin*: The acreage 85, and the condition 120. *Butts*: The stand and condition unusually good. *Columbia*: Looking well. *De Kalb*: Well worked, and fine promise. *Hall*: Not doing well; too much rain. *Hancock*: Very grassy, owing to too much rain, and not fruiting well. *Laurens*: Never better, and in good tilth. *Madison*: Bad stand, and two weeks late. *Mitchell*: Most promising crop since 1865. *Dodge*: Best prospect in four years. *Haralson*: Two weeks late, but looking well. *Jefferson*: Much above average. *McDuffie*: A wet June has injured the crop to a large extent on all low lands; it is in the grass on many farms. *Walton*: Very promising. *Hart*: Late two weeks. *Lincoln*: The profusion of rain June 11–18, overflowing the bottoms, totally destroyed 5 per cent. of the crop. *Terrell*: Prospect improved very much in June. *Fulton*: Well worked, and looks well; blooms on the 24th of June. *Carroll*: Promises a good yield.

FLORIDA.—*Jefferson*: Greatly damaged by the most destructive rain-storm ever known. *Madison*: Fine. *Jackson*: Prospect good. *Taylor*: Much damaged in the lower part of the county by excessive rains.

ALABAMA.—*Clarke*: Quite small; much later than last year. *Greene*: Late twenty to twenty-five days, but in good growing condition. *Crenshaw*: Very fine, though the acreage is decreased 25 per cent. *Monroe*: Small, but looks well. *Lauderdale*: More backward, and smaller than last year. *Blount*: Very backward. *Conecuh*: The plant small, but free from grass and weeds, and well fruited. *Perry*: Late ten days, but very promising. *Colbert*: Growing finely. *Cherokee*: Has a fine growth, but has suffered from excessive rains and want of clean cultivation.

MISSISSIPPI.—*Grenada*: Has come out wonderfully during June. *Amite*: Reduced acreage, but better cultivation. *Pike*: Promising. *Perry*: Young, but looks well. *Monroe*: The plant healthy and in good condition. *Yazoo*: Backward two weeks. *Louises*: The prospect not so good as last year. *Newton*: Far behind last season in size and stands. *Chickasaw*: Stands not good in places, and ten days late, but healthy. *Clarke*: Late two weeks. *De Soto*: Late, but healthy. *Franklin*: Two weeks late; small; free from grass and weeds; too dry. *Lincoln*: The plant small, but looks well.

ARKANSAS.—*Saint Francis*: Two weeks late, but looking well. *Yell*: Fine. *Monroe*: Coming forward rapidly. *Bradley*: A part rather late; chopped out, and looking healthy and thrifty. *Izard*: Well cultivated, and promises a full average. *Marion*: Injured by cold nights and storms of rain. *Ouachita*: Very poor prospect.

TENNESSEE.—*Gibson*: Late, but looks well. *Giles*: Small and backward, but improving.

MISSOURI.—*Dunklin*: Favorable; branched lower on the stock, and the leaves larger than for years; squares well formed. *Mississippi*: Not well cultivated, owing to the rains.

LOUISIANA.—*Concordia*: The water is so slow and subsiding from overflowed lands, that there will be a large decrease in acreage. *East Baton Rouge*: In splendid condition in all the localities where the labor has not been interfered with. *Lafayette*: Slightly improved by the favorable weather. *Madison*: Twenty per cent. lost by overflow; the remainder growing finely. *Carroll*: Healthy and fine, but in the grass in some localities. *Jackson*: Backward, but doing well.

TEXAS.—*Bexar*: Late three weeks, but growing rapidly. *Burnet*: Backward. *Fannin*: The most favorable seen here for years. *Bastrop*: Flattering prospects. *Upshur*: Later than last year. *Colorado*: A little late, but one of the most promising crops for years. *Laraca*: Later than last year, but the condition splendid, though suffering from drought in localities. *Williamson*: Very promising. *Red River*: Growing very fast. *Matagorda*: Early crops very fine, but the greater part very late and small. *Walker*: Damaged by rains. *Austin*: Early-planted on sandy uplands very promising; on black uplands and bottoms very backward. *Collin*: Doing well. *Dallas*: Never better. *Gillespie*: Acreage increased 400 per cent., and in good condition. *Smith*: Late two weeks, but very healthy and promising. *Titus*: Doing finely. *Washington*: Late three or four weeks, but looks first rate. *Travis*: Growing finely.

TOBACCO.

The acreage in tobacco in 1876 appears to be less than in 1875. Our reports exhibit some very remarkable variations in the areas planted in the different States. Nearly all the great tobacco regions have planted a smaller breadth than last year. Massachusetts has fallen off 20 per cent., Connecticut 5 per cent., New York 3 per cent., Maryland 6 per cent., Virginia 39 per cent., North Carolina 58 per cent., Tennessee 33 per

cent., Kentucky 16 per cent., Ohio 3 per cent., Indiana 5 per cent., and Illinois 9 per cent. On the other hand Pennsylvania has increased her acreage 22 per cent., Texas and Arkansas each 32 per cent., Missouri 17 per cent., and Kansas 15 per cent.

The condition of the crop in all the States reporting is about 3 per cent. below average. The highest condition, 105, is found in Connecticut and Texas; and the lowest, 81, in North Carolina and Wisconsin. The New England and Middle States are full average or above. Virginia accounts for her diminished area and low condition, 82, by the scarcity of plants, which were, in numerous localities, destroyed by drought, frost, flies, and grasshoppers. The same difficulty embarrassed the planting in North Carolina, Tennessee, and Kentucky; though in some counties of the last named excessive rain was as injurious as the drought. North of the Ohio River heavy rains injured lowland crops. Missouri and Kansas succeed in getting in large crops, which are in fine condition. A more extended inquiry will be instituted hereafter, and the results will be given more in detail.

MARYLAND.—*Howard*: Good planting-season and the plants, just set out, looking well.

VIRGINIA.—*Caroline*: The crop will be later than usual, owing to a scarcity of early plants. *Pittsylvania*: Early plants killed by frost, and late by the tobacco-fly. *Chesterfield*: Less planted than last year. Looking well. *Powhatan*: Plants nearly all destroyed by fly. A third of the usual crop may be planted, but that late. *Fluvanna*: Very short and late. *Lunenburg*: Acreage less than last year, owing to a scarcity of plants, caused by the fly. *Orange*: Has suffered from drought. *Amelia*: The small acreage of tobacco owing to dry weather and scarcity of plants, they having been destroyed by the fly worse than ever before. At present not one-seventh of a crop stands on the land intended for tobacco. *Campbell*: Poor prospect. *Dinwiddie*: Diminished acreage, owing to scarcity of plants, caused by dry weather; that planted growing well. *Franklin*: The grasshoppers are injuring the tobacco more than ever known. They and the dry weather for the last twenty days have greatly blasted the prospect. *Prince Edward*: Planting reduced by scarcity of plants and dry weather. *Halifax*: The scarcity of plants, owing to frost, insect injuries, and unpropitious seasons for planting, make the prospect the gloomiest ever known. *Mecklenburgh*: Doing badly, owing to the long-continued drought.

NORTH CAROLINA.—*Warren*: The first crop of plants killed by cold and the black fly, the second crop being small and tender; may die after being set out at this late season. *Alamance*: Scarcity of plants; some without any; not over 60 per cent planted; poor prospect. *Davidson*: Growing. *Rockingham*: Acreage and condition worse than was ever known. *Yadkin*: Very little over half a crop planted. The plants were killed by cold in March. *Caswell*: Shorter crop than for thirty years. *Person*: Failure of plants. Not more than 19 per cent. of a crop planted, and that has been nearly eaten up by the fly and grasshopper. *Orange*: The plants destroyed to such extent that only about 33 per cent. could be set out. *Davie*: Plants destroyed in the beds by bugs; not more than half a crop planted, and much of that very late.

SOUTH CAROLINA.—*Edgefield*: Tobacco patches dot almost every plantation.

FLORIDA.—*Gadsden*: Stands somewhat defective, but well cultivated and free from grass.

ALABAMA.—*Crenshaw*: The best we ever had.

TEXAS.—*Austin*: Fine.

ARKANSAS.—*Boone*: Early plants killed by frost; crop consequently late, and now suffering from lack of cultivation, owing to excessive rain.

TENNESSEE.—*Trousdale*: Short crop for the want of plants. The early plants were devoured by insects. *Gibson*: Decreased acreage, owing to scarcity of plants; fine season for setting out the plants. *Smith*: The plants have failed, so that no one estimates the crop above 75. *Giles*: Acreage reduced by a failure of plants. *Robertson*: Plants were very scarce, and the grasshoppers have been very destructive to them. *Dickson*: Bugs destroyed most of the plants in early spring. *Macon*: The crop 33 per cent. shorter than anticipated three weeks ago; the plants have not grown well. *Montgomery*: Being seriously injured by grasshoppers.

WEST VIRGINIA.—*Doddridge*: Not more than half a crop.

KENTUCKY.—*Davies*: Badly damaged by excessive rains. *Logan*: Not more than 33 per cent. of last year's acreage for want of plants. *Ohio*: Drowned out in a portion of the county. *Gallatin*: Very late and small. *Mason*: All set and growing. *Warren*: Acreage short, owing to a failure of plants. *Hardin*: Looks well. *Calloway*: Damaged by heavy rains, causing the stock to rot off; grasshoppers and bugs very destructive to

the crop. *Monroe*: Only half a crop, set out late, and the grasshoppers have destroyed at least one-sixth of that. *Todd*: About 75 per cent. of a crop planted, but not growing.

INDIANA.—*Spencer*: June very wet, and the crop a failure on low land.

MISSOURI.—*Chariton*: Grows finely. *Stone*: Late, but looks well. *Vernon*: Only a small per cent. planted, owing to a very wet spring.

KANSAS.—*Linn*: A large crop in place of none last year, owing to the grasshoppers.

FRUIT.

The condition of the fruit crop was less favorable on the 1st of July than on the 1st of June. Most of the States report lower condition of the apple and peach crops, as a whole, though in different parts of the country localities boast of an unusual supply, and a good prospect of fruits not yet ripened. The following notes from our correspondence illustrate the local aspects of the fruit-supply for the coming year:

VERMONT.—*Grand Isle*: Light, owing to ravages of forest-worm in 1875. *Essex*: Very little of any kind, owing to the hard winter.

PENNSYLVANIA.—*Bedford*: All kinds will be plenty. *York*: Promise of an abundant crop.

VIRGINIA.—No fruit except apples and wild berries, of which the crop is larger than usual. *Campbell*: Scarce, except in a few localities.

NORTH CAROLINA.—*Alamance*: Light crop. *Perquimans*: Except peaches, an abundant crop.

MISSISSIPPI.—*Lowndes*: A good crop of grapes and figs, which rarely fail; and small fruits are abundant.

TEXAS.—*Panola*: The pear trees are nearly all dead from blight.

TENNESSEE.—*Sullivan*: A light crop, but doing well. *Bedford*: Small fruits very good. *Bradley*: Pears and plums plenty.

OHIO.—*Ashtabula*: Cherries and strawberries better than usual. *Clermont*: Strawberries, raspberries, and other small fruits have done well. *Geauga*: All small fruits prosperous. *Hardin*: Raspberries and blackberries promise well.

MICHIGAN.—*Wayne*: All kinds never better. *Lenawee*: Cherries seem to be blasted, dropping off all the time. *Allegan*: All small fruits never better. *Mason*: Never a better prospect. *Newaygo*: Fruit-trees of all kinds blossomed unusually full, but the fruit falling off to such an extent as to indicate a very short crop.

INDIANA.—*Decatur*: Promise of the largest crop ever grown. *Hamilton*: A fine crop of all kinds, including berries.

WISCONSIN.—*Green Lake*: All kinds doing well.

IOWA.—*Tama*: Never better.

MISSOURI.—*Cass*: The different fruits have been reduced one-half by four or five hail-storms. *Ralls*: All kinds good. *Grundy*: Has done well generally, and cherries a perfect success. *Buchanan*: But half a crop. *Harrison*: Fruit-trees were very full of bloom, but the fruit has fallen off badly.

KANSAS.—*Douglas*: Light, except a fair crop of grapes and cherries.

OREGON.—*Multnomah*: The fruit-crop bids fair to be bountiful. *Linn*: All kinds nearly a failure. *Clackamas*: After a long season of cool, cloudy, and rainy weather, about the 11th of June the sun shone out with scorching heat, and for eight days the thermometer, in the shade, ranged from 90° to 106°; grape and blackberry leaves were scorched to a crisp, and gooseberries and currants were cooked on the bushes.

UTAH.—*Iron*: All killed by late frosts, except about 25 per cent. of a crop of berries. *Kane*: Fruit promises extra well, what is left.

APPLES.—Vermont and Connecticut report an improvement upon their high June averages, but the other States of New England have declined. The general condition is still above average. Franklin, Maine, complains of caterpillars, but the ravages of fruit-insects seem to be comparatively trifling this year. The Middle States are all above average, though all have declined from the high condition reported for June. Erie, New York, reports the deadening of the ends of small limbs to the length of six to twelve inches through some agency not stated. Of the South Atlantic States, Maryland has fallen to an average; but all the other States of this section, though still below average, have partially recovered from the low condition reported in June. The Gulf States, except Texas, have still further declined, Louisiana and Mississippi expecting but little over half a crop. Of the inland southern States, Tennessee and Kentucky have improved, the latter ris-

ing above average, but Arkansas and West Virginia have fallen off, and are 20 and 30 per cent. below average. North of the Ohio River, all except Indiana have declined, the northern localities being still above average. Prices in some localities are very low. Blight or insects are injuring the trees in a few counties. Except Nebraska, all the States west of the Mississippi have declined from their high June condition, but the general prospect is still for a crop above average. The Pacific States have declined, and are from 7 to 10 per cent. below average.

MAINE.—*Franklin*: Caterpillars destroyed the crop.

NEW HAMPSHIRE.—*Hillsborough*: A fair crop.

VERMONT.—Small quantity; above average in condition.

CONNECTICUT.—*New London*: Prospect of a large crop.

NEW YORK.—*Genesee*: Promise abundantly. *Saratoga*: Doing well; no worms troubling the trees. *Washington*: Promise abundantly. *Erie*: Light crop. *Allegany*: On the trees the ends of small limbs die, 6 to 12 inches in length, leaves, fruit, and wood.

PENNSYLVANIA.—*Indiana*: Will make a large crop. *Elk*: Never before so fine a promise.

MARYLAND.—*Caroline*: Falling off. *Worcester*: Very many dropped off.

VIRGINIA.—*Richmond*: A larger crop than usual. *Elizabeth City*: Plenty, and good.

NORTH CAROLINA.—*Gaston*: Making a better show than was expected. *Wilson*: Fine; best crop since 1872. *Davie*: Not more than half a crop. *Hertford*: A very large crop on the trees.

SOUTH CAROLINA.—*Clarendon*: A good crop, but very small. *Chesterfield*: A disease is killing many apple-trees, particularly young trees; similar to the pear-blight.

GEORGIA.—*De Kalb*: Not so badly damaged by the blight as was thought a month ago. *Walton*: The trees were full, but the fruit is falling badly. *Carroll*: A disease similar to rust in wheat is killing the apple-trees.

FLORIDA.—*Jackson*: Partial failure.

ALABAMA.—*Greene*: Trees dying from blight; those that have escaped are bearing a fair crop of good fruit.

TEXAS.—*Panola*: Have dropped off badly since the June report. The ends of small twigs have died. *Titus*: Some disease, blight, or insect, has badly injured our orchards; the fruit drops, and twigs and limbs are dying.

ARKANSAS.—*Cross*: Light crop. *Sharp*: Falling off. *Fulton*: Fair crop.

TENNESSEE.—*Monroe*: Compare favorably with last year. *Serier*: Abundant. *Bedford*: Exceedingly abundant. *Bradley*: Plenty. *Greene*: Set well, but dropped off badly.

WEST VIRGINIA.—*Pocahontas*: Few. *Braxton*: Small crop in good condition.

KENTUCKY.—*Shelby*: Half a crop in place of none last year. *Callaway*: Small crop doing well.

OHIO.—*Columbiana*: Not more than half a crop. *Geauga*: Many have fallen off, but promise above average. *Lorain*: Falling off badly. *Wood*: Dropping off badly, but a fair crop will be left. *Hancock*: Plenty, but falling off rapidly.

MICHIGAN.—*Wayne*: Never more promising. *Mason*: Prospect never better.

INDIANA.—*Decatur*: Promised well, but have fallen off badly. *Howard*: Reduced 30 per cent. since June 1, by falling off. *Cass*: A blight has appeared in the apple-trees, which is doing great damage. It seldom goes below the present year's growth, and it attacks some varieties more than others. *Floyd*: The crop will be immense; now worth only \$1.50 per barrel. *Hamilton*: A fine crop. *Kosciusko*: A light but fine crop. *Washington*: Falling off very much. *Whitley*: The trees suffering from some kind of a twig-blight. The young twigs die when ten inches long or less.

ILLINOIS.—*Hardin*: Most orchards are full and of fine quality. *Mercer*: A good crop. *Mason*: Doing well. *Madison*: Less fruit than was expected from the bloom. *Pulaski*: The pear and apple blight is making sad havoc with the trees.

WISCONSIN.—*Walworth*: Medium.

IOWA.—*Humboldt*: Fine. *Jackson*: Best prospect for many years. *Audubon*: Injured by drought. *Jefferson*: Promising.

MISSOURI.—*Cass*: A great many have dropped off. *Butler*: Half a crop. *Caldwell*: Have dropped off till scarcely any are left. *Platte*: Not more than one-eighth of a crop, but very good. *Vernon*: Failed all through June through some unknown cause; reduced 50 per cent. *Perry*: Falling off.

KANSAS.—*Franklin*: The wine-sap is almost the only variety which bears a full crop. *Jackson*: Dropped off badly while small. *Wabunsee*: Large crop in the western part, where alone they are cultivated to any extent.

CALIFORNIA.—*Yuba*: Short crop. *Sonoma*: The crop seriously injured by excessive heat in June.

PEACHES.—Only three States, Massachusetts, Iowa, and California, will have average crops of peaches. Connecticut, Delaware, Maryland, Virginia, North Carolina, Georgia, Texas, Kentucky, Illinois, and Missouri find their condition somewhat improved during June, but in the other States there has been a decline in some cases to figures indicating a total failure of the crop. The great peach regions of the Middle States show a very serious decline, Delaware promising not much over a fourth of a crop. In the South Atlantic and Gulf States the promise is from a fourth to a half a crop, and in the inland Southern States still less; Arkansas will probably realize less than 10 per cent. of an average. North of the Ohio River the small crop of Michigan is nearly average, but the great crops of Ohio, Indiana, and Illinois are at least 40 per cent. below average on the whole. West of the Mississippi the facts are about the same; the northern counties of Iowa and Nebraska are average or above, but Missouri and Kansas are but little over half an average. On the Pacific coast California reports a condition improved during June and above average; Oregon 10 per cent. below average and considerably below the June report.

PENNSYLVANIA.—*Light crop.*

MARYLAND.—*Caroline: Entire failure. Worcester: Utter failure.*

VIRGINIA.—*Few, except old seedlings. Prince William: Trees of the natural fruit quite full.*

NORTH CAROLINA.—*Wilson: Fine; Hales' Early doing very well; not rotting on the trees as heretofore. Hertford: Not entirely killed by the late frost.*

SOUTH CAROLINA.—*Clarendon: Poor crop.*

GEORGIA.—*Carroll: The crop much better than expected.*

FLORIDA.—*Jackson: Partial failure.*

TEXAS.—*Dallas: Light crop.*

TENNESSEE.—*Greene: Quite scattering.*

KENTUCKY.—*Shelby: Half a crop in place of none last year.*

MICHIGAN.—*Wayne: Never more promising. Mason: Prospect never better.*

INDIANA.—*Decatur: Promised well, but have fallen off badly. Floyd: Thin on the trees and badly rotting. Hamilton: A fine crop. Kosciusko: Less than half a crop, but look well. Madison: Seedlings only show fruit.*

IOWA.—*Jefferson: Promising.*

MISSOURI.—*Phelps: A great many have dropped off. Caldwell: Have nearly all dropped off. Saint Clair: Some orchards full while others have none; quality good. Harrison: Fine crop.*

CALIFORNIA.—*Sonoma: Promise of an exceedingly large crop.*

GRAPES.—The grape-crop of New England would indicate very nearly an average condition but for winter-killing in some of the northern portions. The Middle and South Atlantic States promise nearly an average yield. Some local complaints of caterpillars come up from Virginia, but generally injuries of this kind are conspicuous by their absence. The condition of the crop in the Gulf States is from 20 to 25 per cent. below average, but in the inland Southern States, excepting Arkansas, it is above average. North of the Ohio the condition would be nearly average but for the tendency to rot and mildew, resulting from recent heavy rains. Between the Mississippi and Missouri Rivers the condition on the whole is about 10 per cent. below average; west of the last-named river, nearly 10 per cent. above. The Pacific coast is about average.

MAINE.—*York: The vines badly winter-killed; the roots sprouting again.*

PENNSYLVANIA.—*Indiana: Will be an extensive crop.*

MARYLAND.—*Caroline: Good. Worcester: Promise of full crop.*

VIRGINIA.—*King George: Promise abundant. Elizabeth City: The vines infested with caterpillars, and the fruit dropping off.*

NORTH CAROLINA.—*Gaston: Above the usual full bearing. Hertford: In abundance.*

SOUTH CAROLINA.—*Clarendon: Abundant. Newberry: Were unusually promising, but the continuous rain has caused them to rot badly. Lexington: On sandy soil and low land have rotted some from the wet weather, but on clay soil are sound, and promi*

ise an abundant yield. *Richland*: Most of the bloom destroyed in April by a frost, but vines bloomed again, and will make 67 per cent. of a crop.

GEORGIA.—*Lumpkin*: A good crop of wild grapes. *Troup*: Fine.

FLORIDA.—*Santa Rosa*: In some localities the Scuppernong have done worse than ever before, in others they are very fine. All other grapes are very fine. *Jackson*: Good yield expected.

ALABAMA.—*Baldwin*: Not injured; Scuppernongs the standard. *Greene*: Fully up to average in quantity and quality.

MISSISSIPPI.—*Lowndes*: A good crop.

TEXAS.—*Bowie*: Thousands of bushels of wild grapes of different varieties, some of them very large and rich in flavor, could be gathered in the county. *Coryell*: Very fine. *Nueces*: The grape interest is growing in importance. Several vineyards recently started with 1,000 to 3,000 vines, and some of them now bearing very fine fruit. *Dallas*: Rotting.

ARKANSAS.—*Cross*: Light crop. *Fulton*: Rotting.

TENNESSEE.—*Greene*: Promise well.

WEST VIRGINIA.—*Monroe*: Abundant crop.

OHIO.—*Vinton*: Best prospects ever known. *Wood*: Very fine. *Hancock*: All right. *Mercer*: Never better.

MICHIGAN.—*Wayne*: Never more promising.

INDIANA.—*Kosciusko*: Mildewing badly, owing to incessant rains.

ILLINOIS.—*Madison*: Beginning to rot.

WISCONSIN.—*Walworth*: Better than last year.

MISSOURI.—*Phelps*: Quite promising, but some are rotting. *Barton*: Total failure of all fruits except grapes. *Ripley*: Rotting considerably. *Vernon*: Abundant and fine. *Montgomery*: Rotting badly. *Perry*: Nearly all rotting.

KANSAS.—*Franklin*: The rot is threatening fearful destruction. *Montgomery*: Badly damaged by rose-bugs.

CALIFORNIA.—*Yuba*: Large yield. *Sonoma*: Promise of an exceedingly large crop.

FLAX.

NORTH CAROLINA.—*Camden*: A good crop housed.

WISCONSIN.—*Stearns*: This crop laid aside; the mustard-seed sown with it is overwhelming the land.

MISSOURI.—*Henry*: The acreage of corn reduced by the very large acreage of flax sown for the seed. *Bates*: The area increased 20 per cent. and is looking splendid, promising 14 to 18 bushels of seed per acre. *Lawrence*: Considerable flax is being raised this year, and it grows very fine. *Vernon*: Late, but a good prospect for 8,000 bushels of seed.

KANSAS.—*Johnson*: Splendid. *Franklin*: About average.

Table showing the condition of the crops, &c., on the 1st day of July, 1876.

States.	CORN.		WHEAT.		RYE.		OATS.	BARLEY.		PASTURE.	CLOVER.	TIMOTHY.	POTATOES, (Solanum tuberosum.)	
	Average com- pared with last year.	Average condi- tion July 1.	Average condi- tion of winter wheat July 1.	Average condi- tion of spring wheat July 1.	Average condi- tion of winter rye July 1.	Average condi- tion of spring rye July 1.		Average condi- tion of winter barley July 1.	Average condi- tion of spring barley July 1.				Average com- pared with last year.	Average condi- tion July 1.
Maine.....	104	102	102	102	103	101	103	.....	100	109	96	96	100	103
New Hampshire.....	97	95	102	102	99	101	103	.....	102	105	103	94	94	97
Vermont.....	100	84	101	101	101	100	101	.....	103	108	94	97	97	102
Massachusetts.....	130	100	100	100	102	100	109	.....	104	100	99	100	98	97
Rhode Island.....	107	.....	.....	.....	102	100	81	.....	90	95	105	100	88	92
Connecticut.....	107	98	96	100	100	100	103	.....	100	100	101	99	92	85
New York.....	99	97	100	94	99	99	101	.....	96	101	105	104	85	94
New Jersey.....	103	85	99	98	95	101	103	.....	100	85	94	95	87	97
Pennsylvania.....	101	100	95	100	100	100	89	.....	98	107	105	102	93	98
Delaware.....	100	105	105	102	100	103	103	.....	100	101	100	104	100	100
Maryland.....	100	101	108	102	102	100	89	.....	101	101	103	104	91	98
Virginia.....	103	102	111	.....	99	.....	80	.....	107	101	102	101	103	106
North Carolina.....	103	98	91	101	97	103	92	.....	104	104	111	104	101	101
South Carolina.....	104	95	90	85	103	.....	110	.....	100	102	106	104	102	107
Georgia.....	109	103	63	89	98	.....	115	.....	104	104	106	106	101	89
Florida.....	109	98	.....	.....	101	.....	105	.....	87	102	107	100	101	102
Alabama.....	104	68	.....	.....	82	.....	102	.....	.....	100	106	100	92	84
Mississippi.....	100	92	76	.....	83	.....	99	.....	.....	105	.....	.....	136	103
Louisiana.....	101	99	.....	.....	.....	.....	100	.....	102	108	101	102	106	99
Texas.....	115	121	80	79	100	88	98	.....	88	103	101	102	101	103
Arkansas.....	105	102	66	.....	83	.....	76	.....	102	111	105	108	99	98
Tennessee.....	99	100	94	.....	97	.....	92	.....	88	114	105	105	99	101
West Virginia.....	104	102	115	100	109	.....	101	.....	.....	106	105	97	92	98
Kentucky.....	102	95	96	97	98	90	88	.....	102	108	105	104	89	97
Ohio.....	106	102	86	96	95	95	100	.....	94	108	101	104	92	100
Michigan.....	96	93	102	102	101	102	105	.....	101	112	108	106	99	99
Indiana.....	107	100	79	103	92	90	97	.....	83	106	101	101	98	100
Illinois.....	104	89	97	77	97	90	98	.....	95	110	104	105	93	100
Wisconsin.....	110	91	79	95	95	103	104	.....	103	110	91	105	99	100
Minnesota.....	97	90	92	77	96	91	95	.....	96	97	90	92	100	102
Iowa.....	104	88	94	70	95	88	96	.....	96	105	99	101	97	98
Missouri.....	104	97	103	97	101	102	94	.....	99	106	105	100	125	104
Kansas.....	104	96	111	101	103	105	108	.....	95	107	105	101	112	102
Nebraska.....	130	99	110	90	104	97	98	.....	100	100	106	86	95	96
California.....	134	105	96	105	100	.....	103	.....	104	103	103	101	110	101
Oregon.....	104	101	92	95	96	102	111	.....	93	110	103	109	108	97

INSECT INJURIES.

The record of insect injuries is less formidable than in former years at this stage of the growing season. If the remaining part of the summer and fall should receive the same immunity, this source of annoyance and loss will be of small account in the production of 1876.

Colorado beetles, (*Doryphora decem-lineata*).—This pest is diffused in small proportion over the Eastern and Western States. New Hampshire reports it in large numbers in Cheshire and Rockingham, but not so numerous in Hillsborough and Sullivan. They are in nearly all localities of Rutland, Vermont, and have just appeared in Addison. In Hampden, Massachusetts, they are numerous and voracious, and have put in an appearance in Berkshire and Plymouth. They have just hatched in Washington, Rhode Island. Windham, Connecticut, reports their arrival, while Hartford has been successfully fighting them with Paris green. Their presence is more generally acknowledged in New York; being noted in Columbia, Orange, Albany, Westchester, Delaware, Dutchess, Ontario, Otsego, Saratoga, Warren, Suffolk, Yates, Erie, and Kings. In several counties they are more destructive than in former years. In Sussex, Warren, and Richland, New Jersey, they are numerous, but have been successfully resisted by farmers. They are also destructive in many counties of Pennsylvania; being reported in Wyoming, Indiana, Armstrong, Beaver, Butler, Lehigh, Bucks, Delaware, Union, and Luzerne; in some localities they are more numerous than in any former year. Baltimore and Cecil, Maryland, are troubled with them, but constantly apply the Paris green. In New Kent, Virginia, they greatly damaged early potatoes, and are spreading over the whole county. They are also exceedingly troublesome in Russell, King George, and Prince William. They appeared early in Pocahontas, Grant, and Monroe, West Virginia, but rapidly disappeared. Ohio reports them in one county, (Perry,) but less numerous than in any year since their first appearance. Michigan reports them in Lenawee as "thicker than ever," and as less troublesome in Livingston, Delta, and Iosco. They were plenty in Steuben, Indiana; but in Clark they were not very destructive. They are quite numerous in Lake and Ogle, Illinois, but not very formidable in Richland, Wisconsin, Grant, Minnesota, Dodge, Nebraska, and Buffalo, Dakota. In the last-named county their ravages increase as the drought becomes more severe. In Grant, West Virginia, it is noted that as the beetle disappears, the old-fashioned potato-bug (*Epicauta vittata*) re-appears.

Hessian fly, (*Cecidomyia destructor*).—This insect damages small grain in Snyder, Perry, Lehigh, and Lancaster, Pennsylvania; in Loudoun, Madison, Russell, Clarke, Prince William, and Northampton, Virginia; in Gordon, Butts, Clayton, Cobb, and Carroll, Georgia; in Coryell and Collin, Texas; in Boone, Arkansas; in Grand Traverse and Ionia, Michigan; in Waseca, Watonwau, and Hancock, Minnesota; in Jackson, Mitchell, Tama, and Clay, Iowa; in Phelps, Missouri, and in Cherokee and Neosho, Kansas. In some cases the damage was serious.

Weevil or midge, (*Diplosis* [*Cecidomyia*] *tritici*).—This insect is noted in Ionia, Michigan, and in Howard, De Kalb, Hamilton, Wabash, and Wells, Indiana.

Chinches, (*Micropus* [*Rhyparochromus*] *leucopterus*).—These insects are troublesome this year only in a few counties of the Northwest, being more or less destructive in Ogle and Winnebago, Illinois; in Grant,

Walworth, Washington, and Green, Wisconsin; in Jackson, Johnson, and Marion, Iowa; in Atchison, Missouri; and in Lincoln, Kansas.

Grasshoppers.—Different species of this pest are noted in different parts of the country, but their destructive sphere is yet quite circumscribed. The *Caloptenus femur-rubrum* is noted in Sullivan, New Hampshire; in Franklin, Virginia, it was very destructive on tobacco, as also in Person, North Carolina; in Cherokee, Alabama; in Robertson and Montgomery, Tennessee. The *C. spretus* is reported in Lyons, Redwood, and Watonwan, Minnesota; in Richland, Dakota, and in Jefferson, Montana. In Taos and San Miguel, New Mexico, a grasshopper which cannot be designated by the imperfect description given greatly injured the crops. It is known by the local name, "Little giant."

Miscellaneous.—In Franklin, Maine, fruit-caterpillars (*Olisiocampa*) have destroyed many apples. The canker-worm, (*Anisopteryx vernata*) is less numerous in Plymouth, Massachusetts, than in former years. An insect, supposed to be the boll-worm, (*Heliothis armigera*), injured both cotton and corn in Fannin, Rabun, and Union, Georgia; in Blount, Sequatchie, and Van Buren, Tennessee. Jackson, Florida, is the only county, so far, that reports the cotton-caterpillar, (*Anomis* [*Aletia*] *xylinæ*.) A species of the grub-worm (*Lachnosterna* sp.) is reported in Lycoming, Pennsylvania, and in Armstrong, (?) Tennessee. Joint-worms (*Isosoma* [*Eurytoma*] *hordei*) injured wheat in Cabell, West Virginia. Cut-worms (*Agrotis* sp.) destroyed lowland corn in Lauderdale, Alabama, and the crop generally in Stanton, Nebraska. Wire-worms (*Elater* sp.) injured corn in some localities of Kentucky. The currant-worm (*Nematus ventricosus*) is reported in Plymouth, Massachusetts, and Lenawee, Michigan. In Fannin, Georgia, late wheat was infested with lice, (*Aphis* sp.) Insects undesignated injured corn in New London, Connecticut; Saratoga, New York; Delaware, Pennsylvania, and Cherokee, North Carolina. In Saline, Kansas, a "green worm" damaged wheat while heading in June. In Chase, Kansas, an undesignated insect attacked winter-wheat.

EXTRACTS FROM CORRESPONDENCE.

DISEASES AMONG FARM-ANIMALS.—*North Carolina, Perquimans*: Hogs are dying of cholera.

Tennessee, Henry: The hogs and chickens have the cholera, so called. *Monroe*: Hogs are scarce, and dying of cholera to an alarming extent.

Missouri, Harrison: Some have lost from 5 to 10 per cent. of their hogs from a disease called cholera.

HEAVY RAIN-FALL.—*South Carolina, Beaufort*: A rain-storm in which 15 inches of water fell did great injury to the rice-crop; many plantations on the Savannah were submerged.

Georgia, Richmond: All the lands bordering the Savannah River below Augusta were overflowed June 16 to 19, and crops of all kinds are a total loss. Some plantations report a loss of 5,000 to 10,000 bushels of corn, of which an unusually large amount was planted, and the crop was 10 per cent. above average at the time of the freshet.

Illinois, Woodford: Crops of all kinds looked encouraging thirty days ago; but now, owing to the extraordinary rains, everything in the agricultural line looks discouraging. All low lands are flooded, and the water is destroying whatever is planted thereon. The water-courses are higher than were ever before known by the oldest settlers.

Wisconsin, Dunn : From May 2 to June 26, rain fell during 167 hours on the bottoms of the Chippewa; during May 16, 6½ inches in 12 hours. *Juneau* : Rain-fall greater than for sixteen years. *Outagamie* : Rained for two-thirds of June.

GRASSHOPPER-EXTERMINATORS.—*Nebraska, Hall* : The first English sparrows were imported into this county, from New York, by me this spring. They are now doing well—parents and children.

INCREASE OF GRAIN-CROPS.—*Georgia, Columbia* : We are making more small grain in this section this year than in all the years since the war aggregated. The cotton mania is subsiding, and the disposition to terminate dependence on heavily-taxing merchants is becoming general. Thereby shall we have better times. *Randolph* : More grain planted by 25 per cent. than in any year since the war. *Wilcox* : The people have gone more into provision-crops, and they are doing quite well all over the county.

Alabama, Henry : Our people are becoming convinced that planting too much cotton is ruinous, and will soon plant still more largely corn and small grain. There is among them an evident tendency to practice more rigid economy, and I think they will raise most of their supplies of every kind at home.

Michigan, Iosco : This county is rapidly changing from a lumbering to a wheat and stock-producing county. Merchants and other business men are turning their attention to farming.

CUBA TOBACCO.—*Florida, Gadsden* : Last year's crop of Cuba tobacco, which was the largest and the best that has been grown since the close of the war, still lingers on the market at greatly depressed prices. As a consequence, many of the planters have measurably abandoned its cultivation the present year.

From my experience and observation in the growing of the Cuba tobacco, I am astonished that it is so much neglected by the manufacturers of cigars. I have recently had an opportunity to examine the stock in a large factory, and am convinced that the production of Gadsden County, both as to texture and flavor, is superior to the average article used by them and may be bought at one-half the cost. Here is a favorable opportunity for some enterprising party to realize a fortune by establishing a cigar-factory in the midst of the tobacco region of the State, where he can make his selections at the barns.

AGRICULTURAL SPECIALTIES.—*Maryland, Montgomery* : A large and increasing number of the best farmers in this county are devoting their attention to the dairy. *Wicomico* : In recent years watermelons are raised in our county and exported to northern markets in very large quantities.

Virginia, Chesterfield : Onions are becoming a very important crop. The potato-onion yields 75 to 125 bushels per acre, worth \$1 to \$2 per bushel. *Southampton* : The cotton-crop has been greatly curtailed, and its place taken by pea-nuts.

Indiana, Floyd : The crop of onions is very fine, though decreased in acreage.

Illinois, Montgomery : The honey-crop is very heavy.

Wisconsin, Clark : More attention to dairying and fine grades of cattle.

Missouri, Vernon : The crop of castor-beans is late and foul with weeds. It will be shortened fully half.

UNTIMELY ICE.—*Wisconsin, Douglas* : An immense ice-field, twenty to thirty square miles in area, still at the head of Lake Superior, (July 1.)

AGRICULTURE AT THE CENTENNIAL EXPOSITION.

At the Centennial International Exposition, now in progress at Philadelphia, agriculture may be studied in two complementary aspects. In the building erected by the General Government, the National Department of Agriculture has organized a special exhibit, of which an account was published in our June report. In this exhibit the leading facts and principles of American agriculture are presented in compact logical generalizations. The results of production are shown in classified specimens or *fac-simile* imitations showing the processes and products of culture. The natural agencies, organic or inorganic, which favor or impede the work of the farmer, are shown by a great variety of samples. Statistical charts on a large scale compare the latest results with those of former years, illustrating the annual progress of production and the changes which time is continually working in this oldest and most fundamental of all human industries. This exhibit, while constituting one of the most attractive features of the Exposition for the general public, is especially interesting to thoughtful minds seeking reliable general ideas of our material resources. The statistics which sum up and compare our annual products are of special value to commercial men as giving more clear and definite ideas in regard to the trade in farm-products, while intelligent agriculturists find new facts and principles of culture and new relations between the different branches of their varied industry developed in the statistical investigations of which the results are on exhibition in the Government building.

At Agricultural Hall, on the contrary, the subject is presented from an antipodal stand-point. The miscellaneous collections of private exhibitors embrace a vast amount of details arranged under a previously-devised classification, but it is evident that in a large number of cases objects are brought within the programme only by a very liberal construction of its requirements. A complete and systematic exhibit could scarcely have been anticipated. It is not a comprehensive selection from the multitudinous facts of agriculture of those general features which accurately present the true character of the whole system, but rather a miscellaneous aggregation of such specimens of production as the private interests, public spirit, and special facilities of exhibitors have induced and enabled them to present in response to the invitation of the Centennial Commission. Hence its indications need careful interpretation, having regard not only to its excellencies, but also to its deficiencies. A great redundancy of specimens is found in some branches and a noticeable lack in others. But the full treatment of the subject requires time, diligent research in gathering facts, and deep study in drawing conclusions. The history of the Exposition cannot be even commenced until after its operations shall have been concluded. All that can be justifiably attempted in a sketch like the present is to trace the leading features, to indicate something of its scope and extent, and to give some conception of the wonders of art and nature now presented at this branch of the Centennial Exposition. A brief notice of its general organization will give some relative conception of the part taken in this enterprise by the agricultural interest of our own and of foreign countries.

The grand exposition occupies an inclosed portion of Fairmount Park, embracing 236 acres. Five immense structures have been provided by the Centennial Commission for the exposition of the industry of all

nations; but, besides these, several smaller expositions by the General Government, by separate States, by foreign countries, and by private corporations and individuals for the exhibition of their particular products, either in whole or in part. Of the Centennial Commission buildings, the largest and most striking is the Main Exhibition Hall, 1,880 feet long, 476 feet wide, and covering, with its various annexes, nearly twenty-five acres. This building is devoted to the first three general departments of the exhibition, viz: I, Mining and Metallurgy; II, Manufactures; III, Education and Science. Department IV, Art, occupies a noble structure of marble, erected by the State of Pennsylvania and city of Philadelphia, to perpetuate the memory of this illustrious, patriotic, and industrial enterprise, and hence fitly named Memorial Hall. It is loaned to the Centennial Commission for exhibition purposes, but it will remain one of the great centers of art exhibition in ages to come. It is 365 feet long and 210 feet wide; with an annex in the rear, it covers nearly three acres, and contains an unexpectedly complete representation of all the national schools of art in Europe and America. Department V, Machinery, occupies an immense building 1,402 feet long and 360 feet wide, covering, with its annexes, nearly fifteen acres. Department VI, Agriculture, is accommodated in Agricultural Hall, a unique structure near the northern apex of the exposition inclosure; it is 826 feet long and 540 feet wide, covering ten and a half acres; but the space devoted to this class of exhibits is enlarged by several annexes, adding two or three acres to the covered area. Besides these accommodations within the inclosure, a tract of twenty-one acres outside has been arranged for the exhibition of live stock at different times during the exposition. Trials of agricultural implements and machinery are arranged at points within easy railway access in the neighboring rural districts. Department VII, Horticulture, finds accommodation in a beautiful structure 383 feet long, 193 feet wide, and covering one and a half acres. About forty acres outside the building have been devoted to out-door plants, to garden arrangement and decoration, and to the illustration of different systems of landscape gardening.

It will be seen, then, that two of the seven general heads of classification pertain to soil production. Several branches of manufacture in machinery hall and a large number of products, either in the main hall or in buildings of States, corporations, and individuals, would naturally come under these heads, especially the extensive exhibit of Kansas and some other States. The horticultural exhibition embraces classes numbered from 700 to 739; of these the first ten include ornamental trees, shrubs, and flowers; the second ten, hot-houses, conservatories, and graperies; the third ten, garden tools and accessories; the fourth ten, garden designing, instruction, and management. The exhibits in this department are mostly American. Great Britain contributes two exhibits of ornamental trees and shrubs; Canada, seven exhibits of gardening appliances; France, seventeen exhibits of ornamental shrubbery, conservatory and garden appliances, and plans of garden construction and arrangement; the Netherlands, six exhibits of fruit and ornamental trees, &c.; Sweden, one exhibit of garden tools; and the Argentine Republic, six exhibits of ornamental trees and garden designs. The total of foreign exhibits is thirty-nine, and of American, one hundred and thirty-nine. The exhibits of this department are arranged in admirable taste, and indicate a great advance in horticulture. The methods of garden construction and management, especially in the higher elements of design, are well represented.

The department of agriculture embraces one hundred classes, num-

bered from 600 to 699. Of these, the first ten include arboriculture and forest products; the second ten, pomology; the third ten, agricultural products; the fourth ten, land animals; the fifth ten, marine animals, fish-culture, &c.; the sixth ten, animal and vegetable products; the seventh ten, animal and vegetable fibers; the eighth ten, machines, implements, and processes of manufacture; the ninth ten, agricultural engineering and administration; the remaining ten are devoted to tillage and general management. The total exhibits under these classes are from the following countries: United States, 696; Great Britain 73; Canada, 297; France, 224; Germany, 161; Austro-Hungary, 53; Switzerland, 24; Belgium, 38; Netherlands, 72; Sweden, 85; Norway, 77; Italy, 259; Brazil, 260; Argentine Republic, 632; total, 2,951. The aggregate of the Argentine Republic is especially remarkable, nearly equaling that of the United States. The great majority of these last-named exhibits consist in forest and agricultural products and their preparations, especially textile fibers. There are memorials of a wonderful luxuriance of production, mostly spontaneous. Very few processes are illustrated by specimens, and no implements or machinery are presented except a single model of a pump. Grand capabilities of production are here indicated, with but little of systematic effort to realize their results.

Arboriculture and forest products.—Under this head the United States presents several collective exhibits remarkable for their value and fullness. Kansas has a very fine display of timber from her scanty woodlands. Indiana presents a collection embracing all kinds of timber found in the State. Oregon, Iowa, Delaware, West Virginia, and Michigan show similar exhibits, but not so systematic or complete. The National Timber Preserving Company, of Philadelphia, exhibit their chemical method of timber-preservation. The Eastern Burnetizing Company illustrate their method of wood-preservation by forcing a solution of chloride of zinc into the pores, after having previously expelled the air and sap. It is claimed that the chemical enters into permanent combination with the ligneous fibers, hardening and improving their texture. Canada has a fine collection of rough and sawn timber arranged in a building. Several of these are manufactures of wood, illustrating rather mechanical processes than original growth. Germany sends a specimen of manufactured resins; Austria, two specimens of manufactured wood, and some saffron; Netherlands, some sieve-frames, cork, and a plant one hundred years old; Sweden, some fir timber, grown at latitude 67°, and a regular sylvicultural collection; Norway, some specimens of wood and its manufactures; Italy, seeds, nuts, leaves, &c; Brazil, a variety of samples of native woods and of lumber prepared for market. The Argentine collection is especially full, embracing numerous systematic collections illustrating the arboretum of large provinces.

Pomology.—The exhibit of Pomology includes fruits of the tropical, semi-tropical, and temperate regions. A separate building, called Pomological Hall, has been erected, and connected with Agricultural Hall by a covered way. It is 200 feet long and 180 wide, giving facilities for the display of 8,000 dishes of fruit at one time. For the exhibition of fresh fruits in their season, special occasions were designated by the Centennial Commission, as follows: For pomological products and vegetables, May 16 to 24; strawberries, June 7 to 15; raspberries and blackberries, July 3 to 8; Southern pomological products, July 18 to 22; melons, August 22 to 26; peaches, September 4 to 9; Northern pomological products, September 11 to 16; autumn vegetables, September 19

to 23; grapes, October 10 to 14. Foreign exhibits in this kind of perishable articles are necessarily very scanty. Canada shows some cranberries and a collection of apples and pears modeled in wax; France, a few fruits; Austria, a remarkable combination of currants and gooseberries growing upon the same stem, with some fresh grapes and Turkish prunes. Italy shows some oranges and olives. The cranberry region of New Jersey is represented by some fine specimens. A collection of wax models of apples and pears of Iowa is presented by the board of agriculture in that State.

Agricultural products.—The next head of the classification embraces the direct products of soil-culture, except textile fibers. Several States presented collective exhibits of their capacities for general culture, more or less full. The most prominent of these special exhibits is that of Kansas which, with the Territory of Colorado, occupied a separate building. The specimens are labeled with great care, giving the county, residence, and name of the party by whom they were grown. The yield per acre in each county, from the records of the State agricultural department, is furnished on application. A large map of the State, spread out upon the wall, enables the inquirer to locate each county and to gain very clear ideas of the agricultural character of the State. Wheat stems are shown from 5 to 6½ feet high, with heads 3 to 6 inches long; corn-stalks 13 to 17½ feet high, with ears commencing 10 feet from the ground; oats, 5 to 6½ feet high; rye, 5 to 7 feet high; broom-corn, 18 feet high; blue-grass, 3 feet 4 inches high. The collection of grasses embraces 14 wild varieties, commencing with buffalo grass 6 inches high, and ending with blue-stem prairie-grass over 10 feet high—"too big for hay, but not quite big enough for cord-wood." Clover from 4 to 5 feet high, and ears of corn 12 to 15 inches long, have ceased to astonish the natives of this region. One stalk of corn had 13 ears and another 7. Iowa exhibited a fine collection of cereals, grasses, vegetables, seeds, &c. A remarkable feature in this Iowa exhibit is the collection of specimens of soils from 35 different counties in sections 6 feet deep. Massachusetts, Indiana, Michigan, Delaware, Ohio, and West Virginia also present collective exhibits of soil products. Oregon accompanies a similar exhibit with a printed statement of her resources, in which cereals and grasses are especially prominent. Wheat crops have not been known to fail during the thirty years since the settlement of the State. Neither weevil, smut, nor drought have been known to any extent; the grain is said to attain the weight of 69 pounds per bushel, and oats 45 to 50 pounds; good wheat lands, with good cultivation, yield from 26 to 45 bushels per acre; barley, 40 to 70; oats, 68 to 80. These statements are guaranteed by the Oregon State Board of Immigration. Arkansas has a collection of soil products in a separate building, and distributes publications showing the extent and value of her agricultural resources. The grain production of this State is developing remarkably, while its grass crops are unexcelled by any other State. Corn 14 feet high, and grass 7 feet high, are noted in the history of a recent editorial excursion by newspaper representatives of several Eastern and Northern States. Among large vegetables seen by these tourists, cucumbers weighing over 60 pounds each were noted. The Western North Carolina Land-Company has a collection of cereals, grasses, &c., of the section it represents. Corporations and individuals exhibit specimens of special production of great interest and value to the student of our agricultural resources; some of these, however, have not been rightly located in the catalogue.

England sends a very small list of products of this class, but among these is a very promising new variety of white wheat called "Mainstay

wheat." Though hardy and robust, it produces a grain of remarkably fine quality. It resists the rapid alternations of temperature to which in later years the British climate has become subject; blight and frost have but little influence upon it; it stands the roughest weather in harvest time, and, if desirable, may be left uncut till after barley harvest. In view of the late degeneration in the finer qualities of British wheat, of which complaints have been rife, this variety is looked to with considerable hope, as promising a partial or total restoration of the normal standard of production. It is adapted to either fall or spring sowings, but seed should be selected of grain sown at the same time as the seedling proposed; that is, spring crops should be sown with grain raised from previous spring sowings, &c. Yet the seed rapidly adapts itself to a change in the time of sowing. The wheat yields 82 per cent. of flour, which embraces 63.4 per cent. of fat-forming substances, 21.5 per cent. of flesh-forming substances, 13.2 per cent. of water, and 1.9 per cent. of inorganic matter. Canada exhibits a considerable variety of seeds, grains, &c. The French exhibit is very scanty, while those of Germany and Switzerland are confined almost entirely to tobacco and its preparations; Austro-Hungary shows seed, grain, and hops; Belgium shows cocoa and chicory, with a few cereals; the Agricultural Association of Netherlands, and the Dutch Agricultural Society, have collective exhibits, while individuals and corporations present a few features of agricultural production. A much more extensive exhibit is shown by Sweden, including cereals, grasses, forage plants, tobacco, &c. Several distinct societies have collective exhibits of great interest. Norway has a few specimens of cereals and manufactured tobacco. Italy shows grain, rice, and seeds. Brazil exhibits a very great variety of her peculiar tropical and semi-tropical products, together with grains, vegetables, and grasses from her temperate southern provinces. Tea is grown here, but its ordinary substitute, maté, is represented by numerous specimens. Coffee and tobacco culture are extensively represented. The Fluminense Agricultural Institute shows tea made from coffee-leaves. Several collections of medicinal plants illustrate the therapeutic resources of the Brazilian flora. The Argentine Republic presents a large number of specimens of cereals, mostly wheat, with grasses, tobacco, and vegetables. Several of these exhibits are collections illustrating the productions of considerable districts. Sugar-cane, mandioca, tapioca, coffee, and tobacco appear among the catalogued products.

Farm-animals.—The exhibitions of live stock will be in the live-stock inclosure, outside the exposition-grounds. For horses, the exhibition will be from September 1 to 14; for dogs, September 1 to 8; for neat-cattle, September 21 to October 4; sheep, October 10 to 18; swine, October 10 to 18; poultry, October 27 to November 6. Of land-animals generally quite a number of entomological, ornithological, and other collections are on exhibition, some of which are of decided merit, especially those of the Michigan State Agricultural College and of the Allentown (Pennsylvania) Academy of Natural Sciences. From England, Lord Walsingham shows Southdown ewes and rams. From Canada comes a fine museum of Canadian entomology, by the Entomological Society of London, and several private zoological collections by individuals in different sections. From Vienna, Austria, comes a treatise on the history of bees. Norway shows photographs of Thelemark cattle, with a printed statement of the qualities and economic character of this (almost the only) national breed of that northern region. The Argentine Republic has a large list of exhibits of preserved specimens of zoology, showing some of the peculiarities of her southern fauna.

Of water-animals, fisheries, and of fish-culture and apparatus, the exhibit is quite extensive. The most striking exhibition under this head is by the city of Gloucester, Mass., which claims to stand at the head of the fishing-ports of the whole world in the extent of her operations, the admirable model and construction of her clipper-vessels, the elaborate facilities for preparing her products for consumption and for placing them upon the market, and, finally, for the enterprise, daring, and skill of her fishermen. Her exhibit at the Centennial Exposition consists of a tank of water, in Agricultural Hall, twenty-three feet long and twelve feet wide, upon which float correct models of her fishing-fleet of both olden and modern times. A miniature wharf of modern construction and a cob-wharf, representative of past days, very strikingly illustrate the progress which has marked this branch of productive enterprise. A graving-dock and marine-railway running down into the water greatly lighten the labor of landing the finny cargoes; miniature crews of model fishermen, clad in garments peculiar to their avocation, present characteristic scenes of the Gloucester fish-trade. Specimens of the products and machinery of fishing, with minerals, mosses, shells, corals, &c., from the sea are ranged around the tank. The statistics of this port for 1875 show a total fish-production of \$3,909,500, of which about half represents the cod-fisheries, and one-sixth mackerel, and nearly one-sixth halibut; the remainder consists of herring, hake, shell-fish, &c.

In the Agricultural Hall large glass aquaria are provided for the accommodation of numerous fresh and salt water animals. These aquaria are themselves exhibits, showing the most scientific methods of preserving live fish. Casts of fossil-fish and marine animals are numerous. Preserved products of the fisheries come from different parts of the country, together with fishing-apparatus and prepared bait. A fish-hatching apparatus from Northville, Mich., illustrates an important improvement in economic civilization. From England the official catalogue notes only specimens of emasculated salmon. Canada shows a considerable number of fishery-products, together with some improvements in fish-catching. France shows numerous fish-products, mostly preserved sardines; one exhibit consists of pearls. Austro-Hungary has some preserved fish, and Netherlands some fishing boats, hooks, &c. Sweden and Norway excel all other foreign countries in the extent and variety of their exhibit under this head. The Swedish Royal Centennial Commission have a collection of fishes living in Swedish waters. Fish-products and processes of fishing are numerous. The Museum of Bergen, Norway, presents a collection of zoological memorials especially rich in the marine and fresh-water animals. Fish-products and fishing-apparatus are shown in numerous and elaborate forms. Among the latter is a unique fishing-sled from Christiania. Italy shows a few eels and sardines in oil. Brazil exhibits isinglass, and the Argentine Republic sea-shells and fishing-lines and baskets.

Animal and vegetable products.—This is an extensive list of exhibits, including preparations of animal flesh, milk, tissue, oils, &c., and numerous vegetable products. The great pork establishments of the West make a fine display of their products, while the glue and candle factories of the East exhibit very creditable specimens. One exhibitor proposes to obviate "the peculiar and unpalatable *piggy* flavor so noticeable in most hams" by a delicate flavoring in the process of cure in combination with pure white powdered sugar. Brands of cooked meats, biscuits of fish-flour, and specimens of mince-meat, illustrate the economic direction of art in the preparation of animal food. One ex-

hibitor showed models of the old cracked Independence bell, of eagles, hogs, &c., made of lard, hardened to resist heat and whitened to the beauty of the purest Parian marble. This head also includes an immense variety of vegetable preparations, of dried and canned fruit, farina, flour, meal, canned vegetables, pickles, relishes, sauces, sirups, starch, maple sugar and molasses, beet-sugar vinegar, wines, spirituous and malt liquors, confectionery, bread, cakes, yeast, vegetable oils, &c. The exhibition of English goods under this head is as varied, if not as extensive, as that of the United States. One English exhibitor has on exhibition a preparation of starch with which he proposes to render fabrics and timber unflammable. He distributes condensed tea and coffee, flavored with milk and sugar, in capsules, one of which will transform a cup of warm water into a cup of either beverage. He has other equally wonderful combinations, for which space is wanting in this report. Canada, among animal products, exhibits skins, leather, preserved meats, &c. Of vegetable products she shows a great variety of flour, meal, starch, vermicelli, preserved fruits and vegetables, wines, spirituous and malt liquors, &c. France presents cheese, leather, (of which a large special exhibit comes from Saint Saems, Seine-Inférieure,) preserved meats; of vegetables her collection includes preserved fruits, confectionery, wines, liquors, vegetable oils, &c. Germany confines her exhibit of animal products mostly to leather; of vegetable products she reports some preparations of cereals, grape-sugar, chocolate, &c., but her great specialties are wine and beer. Austria shows hops, seeds, and cereals; Switzerland, leather, honey, wax, preparations of coffee, chocolate, sauces, absinthe, and other liquors; Belgium, oils, leather, beet-sugar and its preparations, vinegar, wine, cordials, bread, &c.; Netherlands, cheese, horn, glue, medicinal animal oils, feathers, canned fruits and vegetables, flour, bread, chocolate, sugar from grapes, potato-meal, wines, liquors, beer, vegetable oils, &c.; Sweden, dairy products, glue, leather, flour, starch, bread, sugar, confectionery, liquors, (especially whisky from reindeer moss,) vinegar, punch, &c.; Norway, condensed milk, crackers of fish-meal, preserved old cheese, leather, preserved meat, preserved vegetables, spirituous and malt liquors, &c.; Italy, cheese, sausage, albumen, hides, leather, honey of orange-flowers, preserved meats, fruits, dried, candied, and in alcohol; vegetables, sauces, relishes, seeds, bread, flour, pickles, vinegar, wines, liquors, sugar, confectionery, &c.; Brazil, hides, horns, furs, leather, glue, oil, tallow, medicinal plants and roots, coloring-matter, manioc-flour, fruits, vegetable oils, sugar, confectionery, cocoa-oil, vinegar, wine, aguardiente, coffee-liquors, peach-liquor, chocolate, &c.; Argentine Republic, sponges, leather, ostrich eggs and feathers, honey, cheese, butter, hides, furs, animal charcoal, milk extract, dried fruits and nuts, flour, starch, manioc-flour, wines, liquors, vinegar, sugar, confectionery, &c.

Wines and liquors.—The extent of the wine and liquor exhibit invites a more extended notice. The number of American exhibitors is large and representative of a vast capital invested. Several large wine establishments located in the Eastern and Central States make an imposing display of their products. It is noticeable that the wine-making industry tends to crystallize around certain prominent points, but the greatest development of this industry is in California. Here are the most extensive grape culture and wine manufacture. One company in this State has 6,000 acres of land planted mostly in grapes, though as yet but 450 acres are in bearing. This company, in order to secure a perfectly homogeneous and even character for their wines, do not purchase grapes of other producers, but confine themselves to their own

vineyards. Their cellars contain about half a million gallons at one time. Their goods are marketed in California, the States east of the Rocky Mountains, Central and South America, Australia, and China. Some of the finer varieties of these wines are shipped to Europe. In this region European varieties of the grape, such as cannot be grown in the Eastern States, grow in great abundance; but a leading favorite is found in the old Mission grapes of Spanish origin, acclimated by the Roman Catholic missionaries when California was an integral part of Mexico. In the Eastern States only American varieties of the grape can be successfully grown. The leading localities of wine-manufacture here represented are around Egg Harbor, N. J.; Hammondsport, N. Y.; the southern shore of Lake Erie, with adjacent islands in Ohio and several local points in Missouri. Kelley's Island, in Lake Erie, with an area of about 3,000 acres, produces Catawba grapes in greatest perfection and manufactures a superior quality of Catawba wine. Alcoholic distillation from molasses is prominent in New England, and from grain in the central and western grain-producing States; but this industry is but imperfectly represented in the Centennial. Of malt liquors, the exhibit at the restaurants and drinking-stands is far more varied and extensive than in the Exposition Hall. In fact, the consumption of lager is simply stupendous, illustrating the wonderful capacity of the human stomach and the great development of appetite for this Teutonic beverage. Several economic hop-extracts are noted among American exhibits. One of our American exhibitors presents a specific cordial, intended to supersede European cordials.

England exhibits only one kind of wine, extracted from freshly-gathered cowslip-flowers in Leicestershire. It is used mostly for medicinal purposes as a gentle tonic, its alcoholic strength being about equal to the mildest claret. Irish and Scotch whiskies are shown. Koumiss, an extract of cow's milk, imitated from the preparation of mare's milk by the Tartars, is one of the alcoholic preparations on exhibition. Malt liquors in great variety, the characteristic beverages of the fast-anchored isle, are represented by numerous samples. Canada shows a few brands of native wine, some ale, porter, and malt, and some products of distillation. The wine exhibit of France is such as might be expected from the enormous production of that country. Prominent among the regions in which this industry is prosecuted is the famous champagne district, including about four departments of France, viz, Ardennes, Marne, Upper Marne, and Aube. This district extends from Mézières on the Meuse, across the valleys of the Aisne, the Marne, the Loire, the Aube, and the Seine, nearly or quite to the confines of Lower Burgundy. But this extensive region is subdivided into the "poor" and "rich" champagne, the former extending northward from Rheims and the latter confined to the valley of the Marne, embracing about 50,000 acres in vineyards. The vineyardists within this region very dogmatically assert that no real champagne is found outside of the department of the Marne, but wine connoisseurs of accepted authority both in Europe and America declare that much wine of the neighboring districts if branded "Goutte d'Or," "Moque-Bouteille," "Côte-a-bras," or "Closet," would pass the most experienced wine-tasters without challenge. The name Sillery has long outlived the excellence of which it was once an ample guarantee. The choicest vineyards of the establishment have fallen into inferiority by actual mismanagement. Epernay, a few miles west of Chalons, is the great center of the champagne production. Here from 30,000 to 36,000 acres of vineyard, cultivated with extreme care, furnish the

material from which this famous wine is manufactured. Something in the character of the soil and modes of culture give especial delicacy of taste and peculiar bouquet to the juice, which qualities are preserved and intensified by careful and scientific manipulation. About one-fourth of the vineyards are planted with the white grape and three-fourths with the black grape, but both produce white wine, the juice of the black grapes being drawn from the press before the coloring-matter of the skins has mingled with it. In an unusually good year, when the black grapes are especially mature, the wine receives a slight pinkish or amber tinge, which is regarded as an evidence of extra good quality. The best growth of black grapes is found at Ay, Mareuil, Champillon, Hautevillers, Dizy, Epernay, Pierry, Camières, and Aveney-on the Marne; and at Bouzy, Verzenay, Sillery, Mailly, and Rilly, on the mountain of Rheims. The best white grapes are grown at Cramant, Avize, Le Mesnil, Oger, Grauves, and Cuis, to the south of Epernay. Other celebrated wine-districts are also represented by numerous samples—Bordeaux, Burgundy, Jura, Saumur, &c. The most celebrated brands of brandy, eau-de-vie, and other preparations of alcoholic drinks, are also on exhibition. In some cases there are collective exhibits by municipal or other corporations. The catalogue, however, contains no mention of malt liquors from France. The Germanic taste for beer seems to have been eradicated from the Frenchman, whose tastes are rather those of the Peninsular-European races, with whose blood his own is so largely mixed. Germany presents a large array of local brands of wine, alcoholic and malt liquors. The last are especially noted in a collective exhibit from Bavaria, representing the leading brewers of that kingdom. The rich wine-production of Austro-Hungary has but few representatives at the Centennial, and the alcoholic and malt liquors fewer still. Switzerland concocts the diabolical green and white absinthe. Belgium sends a few cordials and one or two brands of beer; Netherlands, gin of the Schiedam brand, and some elaborate alcoholic preparations; Sweden, whisky from reindeer-moss, ale, and prepared punch; Norway, alcoholic and malt liquors. Italy has a long list of wines and spirituous liquors, but none of malt. From Brazil comes aguardiente, from sugar-cane, and also spirits extracted from maté and quinces. A few wines are noted, but not of a generally-known character. The Argentine Republic sends chacoli wine, aguardiente, cherry-liquor, &c.

Textile substances, animal or vegetable.—Our great southern staple, cotton, is presented mostly in collective exhibits, embracing all the local varieties of this country, with a large representation of the fibers grown in foreign lands. Hemp, flax, wool, shoddy, curled hair, bristles, horse-hair, hair-moss are also shown in great variety. England shows wools, Indian rhea, and other fibers, including wool made from old rags, called in this country shoddy; Canada has wool, flax, and hair, and fabrics made from them; France has raw silk and cocoons; Germany, merino wool and horse-hair; Belgium, flax, wool, and white bristles; Sweden, flax rotted by chemicals; Italy, raw and combed hemp; Brazil had a handsome display of cotton, which was consumed by accident, threatening a general conflagration; also hemp-flax, jute, wool; hair, animal and vegetable; silk and silk-worms, tow, flax, &c.; Argentine Republic, cotton, chaguar thread and bark, yuchan-fiber, caraguatá-fiber and fabrics made of it, silk and cocoons, flax, wool, angora fleece, alpaca wool, cow-hair, hair-ropes, &c.

Machines, implements, and processes of manufacture.—In this department, which occupies almost half the building, American inventive genius

is almost alone in the field, exhibiting acres on acres of farm implements and machines, many of which were in motion, being driven by steam. From the nature of these exhibits and the absence of shelving and stand inclosures a better general view of this branch of the exposition is practicable. It is impossible to describe the animation of the scene and the remarkable beauty of the machinery upon which the resources of decorative art have been lavished. The smaller implements are arranged in cases, frequently showing fine artistic taste in their arrangement. Even the large machines are arranged with reference to picturesque effect upon finely-carpeted stages, in remarkable contrast with the rough field-work in which they find their legitimate exercise.

In the official catalogue the first class embraces machines and implements of tillage, such as spades, hoes, rakes, and other tools, plows, cultivators, rollers, harrows, pulverizers, propelled by animal force, and the same, on a larger scale, propelled by steam. Hand-tools are exhibited in endless variety of shape and material. It would seem that inventive genius has anticipated the necessities of soil-culture, and has imagined itself in all possible circumstances, to enable it to detect the difficulties and to facilitate the execution of labor. Spades, shovels, forks, axes, hatchets, hoes, hand-rakes, are arranged in almost every conceivable shape that would overcome or diminish the resistance of the ground. For the breaking-up and pulverization of the soil, plows, cultivators, harrows, rollers, pulverizers, &c., exhibit not only extensive adaptations of old principles, but also new inventions and principles whose validity is yet to be tested in practice. The latter contrivances aim at the accomplishment of the same work with less resistance and consequent expenditure of power, or an increased efficiency with the same exertion. Contrivances to lessen or overcome side-draft, and to utilize the whole motive-power in the direct work of the instrument, indicate one of the objective points of invention. The adaptation of plows to hill-side work, by shifting the mold-board in alternate directions, is an important specialty contemplated in the improvement of tillage. Mold-boards are made of peculiar combinations of metal, having the least practicable affinity for water and mud, in order to meet the requirement of wet, swampy soils. The sulky-plow invites the plowman to an elevated seat, from which he can direct the movement of the instrument and at the same time enjoy the pleasure of a ride. This saving of muscular force in the laborer is in the direction of modern civilization, which as far and as fast as possible relieves the tasks of elementary production. The swivel-plow, leaving no dead furrows, has enlisted many bright, inventive minds in its perfection. Plows adapted to heavy excavation, for railroads and other great enterprises, are constructed on principles differing in some aspects from those of plows for tillage. All of these necessities appear to have been appreciated, and combinations of form and material suited to these circumstances are quite numerous. Experiments with steel and chilled iron have been so far satisfactory as to cause a large investment in plows of these materials. One manufacturing company has invented a new metal for mold-boards, called carbon, a mixture of refined steel, wrought iron, and other metals, which, it is claimed, is harder than steel or any surface-chilled iron. A singular novelty is found in what is called the rotary gang-plow. The mold-board is in the shape of a truncated cone, the edge of its wider diameter being sharpened and made to revolve around the axis of the cone. Its plane of movement is parallel to the line of draft and its sharp edge cuts a furrow whose depth is regulated by a simple mechanism. It may be either directed by handles, as in old-fashioned plows, or it may be

furnished with a seat, like a sulky-plow, and the plowman may ride at ease. A plowman of very ordinary skill is competent to manage this implement. It may be set to turn two furrows, by attaching two rotary mold-boards to the machine. Such are some of the points set forth in this novel invention, but it evidently requires a more complete trial and a more perfect adjustment, in order to meet the requirements of an expanding agricultural enterprise. The enormous extent of plow-manufacture is indicated in the statement of a new firm, making chilled-iron plows in the West. In 1871 they made 1,506 plows; in 1872, 3,049 plows; in 1873, 7,472 plows; in 1874, 14,976 plows in 1875, 31,077 plows. The orders received during 1875 exceeded the production by 10,000. The manufacture for 1876 has been fixed at 75,000 plows as a minimum. Other statements, equally well attested, indicate a similar increase in the production of plows by other firms. The cultivator has become not less important to the farmer than the plow itself, and forms no less elaborate, embodying the latest application of economic principles, are observable in this branch of production. A machine for pulverizing the soil, constructed like a harrow, with circular, sharp disks, instead of teeth, revolving upon shifting axes, is one of the novelties in this line of construction. Harrows are also exhibited in great variety and construction, both solid and jointed. In nearly all these cases the plow or cultivator is to be driven only by horse-power. No steam-plows are on exhibition by American exhibitors, as far as shown by the catalogue.

The next class of implements have relation to planting. Broadcast sowing still has its advocates and adherents among farmers, and to meet this requirement broadcast seeders are still invented, constructed, and sold. One hand-machine is offered at the Centennial which proposes to sow from 4 to 8 acres per hour. The same machine mounted on wheels and drawn by two horses, it is claimed, will seed from 10 to 15 acres per hour. It casts wheat from 30 to 36 feet; barley, from 27 to 33 feet; hemp, from 27 to 30 feet; and generally a heavy seed is thrown further than a light one. Another combines a cultivator with the sowing apparatus in order to break up corn-stalk ground without plowing. But broadcast devices are not numerous at the Exposition, while the drill is found in an immense variety of adaptations. Exhibitors, of course, are profoundly convinced of the superiority of their own machines, and it is not proposed in this article to pass any judgment upon their conflicting claims, but to indicate some leading characteristics of the wares on exhibition. The points of excellence claimed by different machines have respect, mainly, to the regulation of the depth at which the seed is deposited, and of the flow of seed through the pipes. The devices for forcing feed are put forward as prominent advantages by several exhibitors. Arrangements are made by which hoes are deflected by accidental obstructions, such as stones, &c., without breaking. In some cases the quantity of seed discharged through the pipes is regulated automatically by an arrangement in the gearing which may be altered if desirable; in other cases the quantity is regulated by the driver. By a simple contrivance, involving a very slight adjustment, the drill may be transformed into a wheel-hoe. A separate box for the distribution of some concentrated fertilizer with the seed is put forward as an especial excellence of some machines. Specific improvements are claimed in the method of gearing, in the arrangement of the draft, reducing resistance to a minimum, in the materials of which different parts of the mechanism are constructed, in securing a perfect equilibrium when in motion, in perfect ease in operating, in the elimination of straws and other ob-

structions from the seed by spiral wheels or otherwise, in automatic adjustments to suit grains of different kinds and sizes, in the thorough covering of the seed and leveling of the ground after sowing, &c. Corn-planters specially adapted to the seeding of maize are also present in considerable numbers. In some, the seedsman holds the machine to its work by means of handles like those of the plow. In others, he rides upon the machine and regulates its flow of seed by an easy adjustment with either hand or foot. One machine carries an attachment which traces the line of the next seeding-furrow exactly 4 feet from the previous one. For planting in check-rows automatic arrangements are claimed by some exhibitors, while others place this function in charge of a supernumerary man or boy riding on the machine. The corn-planter is also combined with a cultivator-attachment, so as to save plowing in the corn-stubble by thoroughly stirring the surface. No adaptations of seed-machinery to steam-power are noted among this class of exhibits. A few attempts to combine the drill and broadcast methods so that the same machine may answer different and even incongruous purposes, shows the extent and scope of our daring inventive genius.

The most extensive array of farm-machinery falls under the head of harvesters. A few of the machines are devoted to the single function of mowing. In those parts of our country where grain is grown to only a limited extent, and where grass is the staple crop, an implement suited only to mowing, as might be expected, can be constructed with less machinery and of less complicated character than where it is proposed to save the expense of two instruments by combining with the mower an attachment for gathering the grain for bundling. The mower is presented of every size and combination, from the simple lawn-mower, which a single man can drive, to the ponderous two-horse machine. The lawn-mowers are generally combined with a roller-attachment for leveling the ground at the same time the grass is cut. Sometimes these instruments are so large as to require a single horse to supply the motive power, in which case the operator may drive the machine, seated upon it, or he may direct it by means of plow-handles, walking behind it. Of the field-mowers, some employ the direct-draught principle, the knives being located between the wheels, the horses being placed widely apart, entirely outside the swath, by means of a long neck-yoke and double-tree. It works back and forth on the same side of the field. Another machine adapts the side-draught principle, with no purpose of transforming it into a reaper. It claims to have secured, by a new mechanical movement, the easy conversion of the slow rotation of the wheels into the rapid reciprocating motion of the knife, and a noiseless action which the side-draught mowers convertible into reapers cannot attain.

But when grain and grass farming are combined on a moderate scale the economic advantage of a machine which, by a simple adjustment, may be adapted to either kind of harvesting, renders the attractions of the combined machine irresistible as saving in the outlay of capital, which is called for in so many new directions in modern farming. In the earlier machines of this kind, a raker was seated on the platform, raking the grain into bundles as it fell under the knife. But few of that class now hold possession of the market, though one provides a canopied platform for two binders to gather the cut grain into sheaves. The self-raking attachment has been generally adopted, saving one hand in the harvest-field and probably diminishing the draught on the whole. But a third combination is shown in these machines: a binder-attachment gathers the cut grain into sheaves, fastens them with a stout wire, and

then projects them beyond the next swath to be cut. This arrangement saves from two to four hands in the harvest-field, or from \$5 to \$10 per day in harvesting grain, a consideration of special importance, in view of the high prices of labor in the grain-raising regions. A gentleman at the Centennial once saw an old-fashioned harvest-gang of 43 men accomplishing but little more than what this machine claims to average. The mechanical constructions by which these results are secured are various and interesting, but the subject is too extensive for a brief report. In this branch of constructive enterprise the men of brains, of nerve, of untiring energy, all over our land, are contending for the prizes and awards to be distributed in the sight of the whole world, gathered by representatives at the Centennial. No more interesting contest is presented at this memorable Exposition than that between the exhibitors of harvest-machines. Each of these represents an imposing array of intellectual and physical forces, and a history in which the higher qualities of manhood are conspicuously pre-eminent. Other classes of machinery likewise represent a powerful combination of capital, intelligence, and experience, but the most animated and interesting struggle for supremacy will be between the rival harvesters.

Among harvesting-machines the official Centennial catalogue includes hay-rakes, tedders, and loaders. The contrivances represented at the Exhibition represent a wonderful labor-saving economy. In some rakes the dropping of the hay is effected by an automatic arrangement; in other cases it is regulated by the will of the operator, whose hand or foot elevates the tines and allows the hay to fall into the winrow. In some cases both these methods are secured, the automatic arrangement being capable of re-adjustment at the will of the operator. For the handling of hay in larger masses, several contrivances, called hay-loaders or hay-elevators, are presented. One of these is designed to facilitate the gathering of hay upon the wagon. It is a truck of two wheels, to be attached to the hinder part of the hay-wagon. Between the wheels, and revolving with them, is a skeleton cylinder, the bars of which are armed with metallic bent fingers which, on being driven lengthwise over a winrow, gather up the hay and carry it along a revolving flexible frame to the bed of the wagon. It claims to gather up a ton within five minutes as cleanly as average hay-pitchers could perform the same work. Other contrivances, representing nearly the same principles of movement and accomplishing substantially the same result, exhibit some minor modifications and adaptations, the value of which can be tested only by practical results, but they seem to have relieved the hay-harvest of its heaviest remaining labor, that of transferring the hay from the ground to the wagon. If the efficiency of these machines is but half as great as claimed; if a ton of hay can be loaded in ten minutes instead of five, it is easy to see that a moderate crop can be disposed of within the limits of a day and can be readily saved from an approaching storm. A third class of hay-harvesting machinery is that of hay-elevators. These can be adapted either to stacking the hay in the open field or to elevating it into the mow. In the former case, derricks of simple construction give the required fulcrum; in the latter, the barn-rafters afford a convenient attachment. The grappling apparatus may consist of merely a large hay-fork, which being thrust into the hay automatically gathers it in a wide and strong embrace upon being drawn upward, and when arrived at its proper position is made to drop its burden by simply pulling a small rope; or it may consist of a harpoon-fork, which being driven through a mass of hay thrusts out iron fingers at the bottom on pulling a rope attached to the top. When the

lift has arrived over its desired position the slacking of the rope withdraws the fingers and allows the hay to fall. The elevation is accomplished by horse-power, with a pulley combination. Thus every branch of this laborious hay-harvest has been relieved by mechanical processes. Some exhibitors claim to be able to unload an average two-horse wagon within ten minutes.

Another class of agricultural implements includes all contrivances for preparing farm-products for marketing and consumption. In the case of grain-crops the first process is to separate the grain from the stalk. Maize is separated by hand, no mechanical process having yet been discovered whereby the ears can be automatically gathered from the stalk, but several contrivances have proved an economical success by which the grain is separated from the cob. For the thrashing of small grain, machines embracing partial applications of principles still regulating the process were long ago constructed. But the modern thrashing-machine, with its fuller embodiment of those principles, and with its subsidiary processes of separating and cleaning the grain and of elevating the straw for stacking, indicates a great advance in economic science and art. Farmers still living once knew no better way of separating the grain from the stalk than by beating it with flails or by trampling it with horses. Could their fathers, from whom they learned those primitive methods, now revisit the scenes of their earthly labors and witness the wonderful performances of a first-class thrasher and cleaner, they would doubtless feel the most profound astonishment. But familiarized as we are with the gradual expansion of industrial enterprise and with the successive achievements of economic art, we fail to mark the grand eras of progress through which we have already passed. Yet, even to the present generation, the thrashing-machine is a wonder. It represents almost the only great agricultural process to which steam-power in this country has been successfully applied. Among the results of these machines, not including some doubtful extreme statements, one two-horse-power separator, it is claimed, thrashed at the rate of 140 bushels of wheat per hour; a large steam separator, constructed in Wisconsin for a California farmer, thrashed, separated, and cleaned barley at the rate of 10 bushels, and wheat over 9 bushels, per minute, or about 550 bushels per hour. Fanning-mills, without any marked departure from old principles and methods, exhibit a very thorough application of those principles in new arrangements and contrivances for the cleaning of grain. A cockle-separator presents a marked specialty in this class of machines.

In Machinery Hall are exhibited portable and stationary engines, easily adapted to farm purposes. Hay and straw cutters display quite a range of contrivance, from the simple, sharp-toothed hay-knife to an elaborate mechanism driven by horse or even steam power. Baling-presses, for hay, cotton, &c., of great size and strength, are on exhibition. Among the oddities is a sour-kraut cutter, filling a thirty-gallon barrel within an hour. Mills for crushing bones, phosphates, plaster, &c., and machinery for the manufacture of grain into flour, are very elaborate, especially in processes for cleaning the grain prior to crushing, and for separating the offal from the flour. Cider and wine mills and presses are also numerous.

In the steam and horse powers adapted to thrashing, and a few other processes of farm economy, simplicity of construction, maximum force, and compact mechanism seem to have been objective points in the specimens presented. If these have not yet been applied extensively to the heavy rudimentary operations of tillage, it is not for lack of inven-

tive or constructive power, but because economic conditions essential to success do not yet exist on this side of the Atlantic. A water-motor derived from the mere pressure of a hydrant is shown to be economically adapted to light machinery, such as churning, grinding fruit preparatory to pressure, &c. The old-fashioned wind-motor is exhibited in numerous kinds of wind-mills, erected in the rear of Agricultural Hall. Their power is tested in raising water from wells into elevated tanks. A machine of moderate cost and dimensions will supply enough water for a large stock-farm. This motor might also be adapted to a considerable variety of farm machinery, such as fanning-mills, churning, &c. Several devices for meat-chopping are exhibited under this head. Machinery for steaming roots, for scalding hogs, for pressing lard, for paring fruit, for sharpening tools, for making vinegar, for weighing products, &c., are numerous and varied.

At the time the observations for this report were made, the dairy hall had not been opened, and only a small part of the machinery had arrived; consequently no adequate notice of this branch of the Exposition can be given.

Foreign exhibits under the head of machinery, tools, &c., may be briefly summarized. England shows some large and elaborate steam-machinery for plowing and other operations of tillage and transportation, together with elaborate machinery for grinding wheat into flour. Some of this machinery is adapted to the miscellaneous operations of the farm, thrashing, cleaning, fanning, pumping, harrowing, chaff and straw cutting, &c. Canada shows a considerable list of improvements of tillage, harvesting, thrashing, fanning, separating, cleaning, hay and root chopping, cheese-making, cider and wine making, portable and stationary steam-engines, &c. France presents very little competition with us in contrivances for saving labor in the elementary toils of agriculture. She has a few wine and oil presses, corking-apparatus for wine-bottles, new contrivances in wine-making, mill-stones, shearing-machines, &c. Germany has a few improvements in winnowing, sorting, and grinding grain, and in brewing. The Austrian, Dutch, and Swiss catalogues show no entries under this head. Belgium has some machinery for grinding grain. Sweden has some harvesting implements and machinery, plows, and dairy utensils and appliances. Norway, with a small assortment of hand-implements, exhibits a mask for killing cattle. Italy has a few plows and some harvesting-machinery, with a butter-machine. Brazil enters some plows, a machine for preparing coffee, and a filter for sugar-distillation. The Argentine catalogue under this head is blank.

Agricultural engineering and administration.—Under this head the United States exhibits machines for ditching, road scraping and construction, stump-extracting, fence-construction, post-hole digging, ground rolling and leveling, farm-transportation, wagons, carts, harness, yokes, sleds, &c. Many of these contrivances are quite felicitous, dispensing with much labor in the heavier farm-work. Farm-buildings for residence, for the storage of implements and products, for special farm-operations, such as hop-storing, fruit-drying, &c., barns, stables, sheds, abattoirs, &c., are represented by drawings and models. Fertilizers are shown in innumerable samples by a large number of patent-fertilizer companies. The extent of this business, its annually increasing investment of capital and labor, cannot fail to astonish persons whose attention has not been continuously directed to the subject. A type of numerous very large establishments is found in the Pacific Guano Company, of Massachusetts, which has erected a neat building and is testing the economic value of its wares in the growth of flowers and plants on the grounds.

This corporation has a million dollars invested; its object is to prepare for the farmers' use native and imported guano, phosphatic minerals, fish-manure, and other organic matter, &c. England shows some milling-apparatus, grain-weighers, street-sweepers, bee-hives, disinfecting-fluid, baking-powder, &c. Canada has model gates, fencing, harrows, fertilizers, and a bee-hive model. France has some fertilizers and models of agricultural sheds. Germany has plans for gardens and models of works of drainage and irrigation. Sweden has some fertilizers and farm-drawings; Norway some fertilizers. Italy shows a plan of General Garibaldi's system of irrigation in the valley of the Tiber, and a model bee-hive. Brazil has some specimens of guano. The Argentine Republic has artificial manures and a model of a pump. The official catalogue shows no competition in this class from any other nation.

Tillage and general management.—Under this head the United States exhibits artificial food for live stock and cage-birds, devices for training horses, shearing-machines, horseshoes and horseshoe-nails, potato-beetle destroyers, &c. The official catalogue shows no entries from foreign nations.

It should here be observed that the agricultural exhibits of Russia, Spain, and Portugal were not open for inspection at the time the preliminary observations of this report were made, and hence no reference has been made to those countries. A few small exhibits of agricultural matter are located in the main building as parts of small collective exhibits by nations whose industry is but partially exhibited. Oriental nations are conspicuous by their absence in this branch of the Exposition. The wares of China and Japan are almost exclusively in the category of art and manufacture. Turkey, Tunis, and Morocco fuddle American brains by the hookah, or challenge competition in the preparation of coffee.

The agricultural part of the Exposition, as a whole, is a grand and imposing one, but when we come to specialties we find in it very prominent and glaring deficiencies, even in branches of American production. This, however, was just what might have been expected, and was doubtless true of all the international exhibitions that have preceded it. The financial stringency prevailing for the last few years has decreased the number of exhibitors, and has doubtless prevented that full and complete representation in all branches of agricultural industry, especially of American production, which a greater experience and a more systematic effort would have secured. From the impulse given to industrial art by this great manifestation we may expect, on future occasions of this character, a more thorough and systematic presentation of the actual facts of agriculture as well as other departments of production. These deficiencies may, at least in part, be supplied by the official exhibit of this Department in the Government building, in which all the leading facts of American agriculture are graphically presented.—E. C. M.

PLANTING OF FOREST-TREES IN SPAIN, AND DESTRUCTION OF LOCUSTS.

The return of peace in Spain is signalized by the active enlistment of the government in measures which materially affect the agricultural interests of the country, and the development of resources so long prostrated by devastating war. The ravages of locusts, hardly less than the desolations of civil war, have brought ruin upon several of the cen-

tral provinces of the country. In addition to the employment of farmers and cultivators in collecting and destroying the larvæ of the insects, the government has resolved to employ bodies of soldiers in destroying the insects, and to appropriate money in aid of the afflicted localities.

Another subject which at this time engages the attention of the government is the planting of forest-trees, which are wanting in extensive regions of the country. A law has been proposed in the Cortes of Spain for the compulsory planting of forests on a large scale in such regions.

The Department of Agriculture is indebted to the Secretary of State for two communications from Hon. C. Cushing, the American minister at Madrid; the one embracing the royal orders on the subject of checking the multiplication of locusts, and the other the project of the law for enforcing the planting of forest-trees. These documents are subjoined.

SIR: I observe that Congress is taking measures to check the reproduction of locusts which have been so prejudicial to agriculture in some of our trans-Mississippi States and Territories. These insects are, and long have been, one of the plagues of several of the central provinces of Spain. It may be of interest to you to have information of some means employed in that country to protect the same from their ravages. In addition to the measure heretofore in use, of employing the farmers and cultivators at this season of the year in collecting and destroying the larvæ of the locusts for stated compensation at the charge of the various municipalities, it is now proposed to appropriate public money in aid of the afflicted localities, and employ bodies of soldiers to assist the inhabitants.

I annex copy and translation of two royal orders on the subject, just issued by the minister of Fomento, in the first of which representation is made of the purpose of the government to give preferent attention now, on the return of peace, to the cultivation of material interests and to the development of industrial resources, especially agriculture, which have suffered so much from the revolutions and civil wars which recent political extravagances of opinion and violences of act have brought on Spain.

I have the honor to be, very respectfully, your obedient servant,

C. CUSHING.

ROYAL ORDERS.

[Translation.]

MOST ILLUSTRIOUS SIR: Not in vain had the government, seconding the noble and elevated purposes of our august monarch, promised that, so soon as peace became a fact, it would at once dedicate its first cares and its most preferent attention to the real elements of our national wealth, so much decayed and downfallen in these recent years of direful perturbation.

Our country, an eminently agricultural one, has the right to demand from the public powers the first fruits of that happy event which all Spain is now celebrating with unbounded joy; and certainly it is not for the government to haggle about bestowing them, disposed as it is to protect and encourage, by all the means within its proper sphere of action and development, the material interests of the nation, its evil-treated agriculture, its impoverished industry, and its downcast commerce.

The necessities of the war, as pressing as they were terrible, have snatched away from our fields the most vigorous of the arms that labored there, leaving their working and cultivation in lamentable abandonment, which very speedily made itself sorrowfully felt by greatly increasing the price of labor, rendering traffic difficult, and lessening production in a high degree. To these evils, which increased in gravity day by day, the government has endeavored, with all solicitude, to supply an immediate and efficient remedy, by restoring to their sad firesides, to the bosom of their afflicted families, to the parched fields which cried aloud for them, a large number of the proud youth of Spain, who, in the ranks of our heroic army, were yesterday courageously fighting on the fields of battle and shedding their generous blood for the legitimate constitutional monarchy and the liberties of their country. Seventy thousand men already discharged by the government are now spread over Spain, bearing upon their sun-bronzed brows the laurel of victory and in their hands the beauteous symbol of peace, sweet messenger of the great benefits which the country may and ought to yet hope for, if her sons do not forget the recent lessons of their misfortune, and are able to find their inspiration in the public necessities, with resolute purpose to satisfy them, by encouraging and developing all legitimate interests.

And the government has not contented itself with the mere return to their respective provinces of these thousands of men who, after having watered with their blood the

field of destruction in a hundred combats, come now to fertilize, with a more benign and beneficial means, the soil of their country; but, without leaving unheeded the important functions still confided to the army at the present time, it has ordered the return to their homes of the reserves of 1871 and 1872, meditating, moreover, the immediate granting of numerous temporary licenses, to the end that, with the concurrence under all these measures of some 140,000 men in aid of the productive forces of the country, the result of peace may be more positive, the first and most perceptible benefits being distributed among all the provinces.

But there is still more: the government, seeking its inspiration in the necessities of the country, as well as in the lively desires and sentiments of His Majesty the King, always heedful of the welfare and prosperity of his people, finds nothing to interfere with furthering, now that the occasion is propitious, a plan, the happy realization of which would compensate in a certain degree for the want of other means which are not permitted for the present by the situation of the public treasury and the general state of the country, in order to furnish capital to the farmer and abundantly diffuse the teachings of modern science, to the end of giving a correct solution to the difficult problem of obtaining from the soil the largest possible returns.

Trusting that the tranquillity of the nation will admit of it, and that all Spaniards of willing minds, inspired by the holy love of country, are to merge their spirits and their activity, their sentiments and their desires in the common aspiration of the happiness of the country, under the institutions which constitute the whole of the existing legality, guaranteeing public order by means of its attitude and its conduct, the government, which prides itself on being conservative and tolerant, now thinks of realizing one of its most elevated purposes and most ardent desires, avoiding, for the present, any further sacrifice of men on the part of the productive portion of the country, and leaving, for the present year, those who ought to have entered into the conscription, in the embrace of their families, in the peacefulness of their firesides, in the honest and reproductive occupation of agriculture.

It is to be hoped that, with the favor of Divine Providence which has so visibly been vouchsafed to our beloved King, the latter may be enabled to attain so marked a glory in the commencement of his reign, bringing with it so much good fortune to the country and so much satisfaction for the government.

But to the evils which the war has caused to our agriculture, there are, unfortunately, in these moments others to be added, which, being likewise extraordinary although of different character, threaten agricultural production in an extreme degree, if, by all available means, the revivification of the millions of germs of locusts, lying latent in immense tracks of territory throughout thirteen provinces of the kingdom, be not prevented.

The government already, with the sanction of the Cortes, is on the point of obtaining, in so far as may be possible, the indispensable resources needed in order to aid the districts most afflicted by the plague, and which, of themselves, possess the least means for combating it, and is preparing the proper measures for the just appropriation of the funds, and to the end that the service may be performed with the efficiency and rapidity demanded by circumstances; but it is needful to make the result assured in combating this new enemy, which is one of the most destructive by reason of his voracity, spreading his ravages through the terribleness of his infinite numbers. It is necessary to destroy him at his birth, to arrest him in his path, to put him to flight whenever he is able to cause the most damage, to pursue him without quarter, confining him to certain localities at least, in order that all Spain may not feel his ravages, may not weep over the terrible losses he is able to cause, and that he may not bring after him, in the track of his desolating march, misery, famine, and every manner of conflicts.

The districts which are, perhaps, the most invaded are those wherein the least population exists, wherein arms are lacking for so resolute and arduous a campaign, wherein the plow never enters, neither are the civilizing fruits of cultivation obtained. Immense extents of land turned into pasturage are those always preferred by such insects, in order to the better assure their pernicious reproduction, far from the towns and centers of population, distant from cultivated lands, and where, safe from the pursuits which may be attempted by the husbandman, after their development is sufficiently complete and they have strength to spread themselves in thick black swarms, they rise, clouding the light of the sun, to fall like an avalanche which destroys and lays bare everything before it upon the most fertile and verdant places, there, where vegetation displays itself most luxuriantly and most proudly.

To avoid such terrible extremities, fraught with such dire consequences, it is imperative to hasten with efficacious and opportune means, furnishing men and resources without loss of time.

The public treasury makes, as has been already said, the sacrifice which its situation allows. The hands which are lacking, our army can supply them, giving up for such noble labors those who may not be, for the present, indispensable for the fulfillment of the duties pertaining to that branch of the service.

In this manner, at the same time that the soldier maintains his obligation in the

glorious ranks of which he forms a part, he engages, for his own advantage, and for the good, above all, of the country, in the labors most fitted to his situation and class, giving, moreover, a worthy example of the virtues which are combined in him as a citizen, and proclaiming by his acts the benefits of all-blessed peace.

Inspiring himself by these considerations, His Majesty the King (whom may God guard) has seen fit to order that the governors of the provinces invaded by the locusts, in conformity with the various military authorities, shall utilize such forces of the army as, in the judgment of those authorities, may not be indispensable for the needs of their branch of the service, recompensing the sergeants, corporals, and privates with the gratuity previously agreed upon.

By royal order, accorded in council of ministers, I say this to your illustriousness, for your information and the consequent ends. God guard your illustriousness many years.

Madrid, March 27, 1876.

C. TORENO.

The DIRECTOR-GENERAL OF AGRICULTURE, INDUSTRY, AND COMMERCE.

MOST ILLUSTRIOUS SIR: To the end of guaranteeing the application of the funds destined for the work of extirpating the locust, and in conformity with what has been proposed by your direction-general, in order to give a uniform organization in all the invaded provinces to so important a service, upon the results of which depends the avoidance of great evils for the agriculture of the country, His Majesty the King, (whom may God guard,) solicitous for the fate of so highly-prized interests, has seen fit to order the following:

1st. The sums which are conceded by this ministry for the service treated of, will be understood in the conception of aid given to the provinces invaded by the plague, without, however, for this reason, involving the derogation of the provisions of article 2 of the royal order of June 3, 1851, which declares the cost of the extinction of the locust to be provincial or municipal, as the case may be.

2d. The sums destined for each province shall remain at the disposal of the respective governors, who shall designate a depositary therefor from among the voting members of the provincial committee of extinction, so that he may issue in his own name the warrants which may be required. This depositary shall be directly responsible for the legitimate expenditure of the funds, to which end he shall take care to obtain the necessary vouchers.

3d. The said depositaries shall render their accounts within the term fixed beforehand by the royal order of concession, in triplicate, with the countersigned approval (*visto bueno*) of the governor of the province, and on the proper paper, accompanied by the certificate of the accounting secretary of the auxiliary commission of extinction, in accordance with the result of the entries noted.

4th. The provincial and municipal committees will conform their action to that which may be determined by the following instruction, formulated by your director-general, wherein, without changing the existing provisions governing the work of exterminating the locust, the various dispositions now in force are now re-arranged and amplified in accordance with what is counseled by the experience acquired during the last campaign.

By royal order, I say this to your illustriousness for your information and the opportune ends. God guard your illustriousness many years.

Madrid, March 27, 1876.

C. TORENO.

The DIRECTOR-GENERAL OF AGRICULTURE.

PLANTING OF FORESTS.

SIR: The spectacle of the mostly puerile and altogether sterile and profitless political debates, consisting of petty party controversies, destitute even of historical utility, which have chiefly occupied the Cortes during the first six weeks of the session, has not been auspicious to the national welfare of Spain.

These debates, which would otherwise have been tediously uninteresting, have had but one incidental good effect, that of drawing from some of the members, such as Mr. Canovas del Castillo and the Conde de Casa Valencia, admirable discourses in defense of the true interests of the country, in reply to speeches of opposition members, who seem to have spoken for no reason whatever, except to hear themselves speak.

Meanwhile, in the presence of these lamentable divagations of party spirit or personal ambition, so much in disregard of practical legislation, constant exceptions appear, which tend to afford hope that all is not yet lost for Spain. Of this nature is the measure proposed by D. Ignacio José Ezeobar, to enforce the planting of forest-trees, the want of which is so serious a misfortune in extensive regions of the country, especially in the broad and elevated plains of the Castilles and Estramadura.

It would be a work of supererogation for me to speak in detail here of the evil con-

sequences of the comparatively treelessness of this part of Spain, not only in the immediate loss of trees themselves, but in the indirect effects of the absence of proper distribution of rains, and the consequent aridity and unproductiveness of the soil. Many persons think the deficiency of moisture in the table-lands, in so far as affected by the absence of trees, is a modern fact, produced by the progress of population and the improvision of the people in this respect. The evil may have been augmented in this way, but has a deeper and older origin; for the treelessness of the district of the country in question, and its aridity, were noted as existing in the time of the Romans. And the progress of population does not necessarily diminish the forests.

Thus, in the State of Massachusetts, there is at present a larger proportion of acreage in forest now than there was fifty years ago, notwithstanding the great increase of population, if we may trust to the reports of the agricultural associations of that State. There, however, as in so many other parts of the United States, new forest-trees spring up spontaneously, unless prevented by tillage, on the site of the old forests cut down, and even encroach on the neighboring grounds where these are not depastured or tilled. And the problem is why they have not done so in Spain, for which no solution is presented, except that the lands are left open to pasturage by sheep or neat-cattle. But this solution is not a very satisfactory one, the question being whether the pasturage is cause or effect, just as the suggestion of fires to account for the treelessness of our prairies involves doubt whether the susceptibility of waste by fires is cause or effect.

It would seem that the prairies of Wisconsin and Iowa must have existed in a previous state to be overrun by fires, and the plains of Castile by domesticated animals, without which neither could have been so overrun; and, as to the latter, the supposition is confirmed by all which we certainly know, little as it is, of the primeval condition of Spain. However that was, the injurious neglect of plantations in Spain is plainly discernible; and such is the evil which Mr. Escobar proposes to cure by a law for the compulsory planting of forest-trees on a large scale wherever they are wanting in Spain. I observe, in passing, that the plague of locusts is understood to prevail only in regions of country comparatively destitute of forest-trees.

Annexed is a translation of the bill introduced by Mr. Escobar in the congress. It is a fresh example of the plans of national reparation entered into by the persons now in power in Spain.

I have the honor to be, very respectfully, your obedient servant,

C. CUSHING.

BILL PRESENTED BY MR. ESCOBAR.

ARTICLE 1.—In all townships of Spain, large and small, in which, in the judgment of the facultative forestal-inspectors, material possibility for it shall exist, steps shall be taken on account of the ayuntamientos (municipal authorities) for the raising and setting out of the species of trees best suited to the locality and appropriate for boundaries of the larger estates, and those existing of more than twenty-five areas situated within the municipal limits.

ARTICLE 2. Where the ayuntamiento does not own land suitable for the formation of a nursery, it may lease some for that purpose at the usual rates of the locality. The expenses of the formation, reproduction, and conservation of these public nurseries shall be divided among groups of ten ayuntamientos each, that those towns shall contribute also where nature does not allow them to be established within their limits, and which, nevertheless, will be benefited by the distribution of the saplings.

ARTICLE 3. Every cultivator of one or more estates, owned or leased by him, is under obligations to place in January and February the saplings of the annual and gratuitous distribution made by the ayuntamientos, in order to set them out along the boundaries of estates of more than twenty-five areas, beginning by setting out those which are to serve as legal boundary-marks of the different estates, and afterward in the intermediate spaces those which they obtain in subsequent distributions and substitution of live for dead trees.

ARTICLE 4. The setting-out of the trees which are to serve as legal boundary-marks will be done precisely half a meter, within the estate, from the site of the recognized land or boundary mark. When the boundary-line is in dispute, no tree shall be placed until it shall be settled by law or agreement of the parties. These trees, when grown, should be referred to in the description of the estate on making transfers of title.

ARTICLE 5. The vicinal service is obligatory, as set forth by article 74 of the municipal law, for the formation of nurseries, and for aid in the planting of the saplings distributed, as also the pouring of the quantities of water ordered, that the plants while young may take root.

ARTICLE 6. The ownership of the trees given by the ayuntamientos and all their productions belong to the proprietor of the estate, but he shall not pull them up by trunk or root, even when old and decayed, without replacing them by new ones. Those which serve as legal boundary-marks shall never be removed while they live, unless it

be that the owner of the estate is also of the adjoining one. A boundary-line shall only be suppressed and the trees removed when the ownership of two adjoining estates becomes merged into one.

ARTICLE 7. In setting out trees along the boundary-lines of estates, whatever be their size above the 25 areas, there shall be left at least a neutral meter of untilled ground, half on each side, for the transit of laborers and working-cattle, and any tree which may have been set out wrong, or in its growing shall obstruct this meter of untilled ground, shall be removed and replaced at the next distribution; so that the neutral untilled ground should be between two rows of trees of different owners.

ARTICLE 8. Without prejudice to the temporal exemption from taxes conceded by the law of rural population of June 3, 1863, to those who plant trees, the trees of the estate boundary-lines given by the ayuntamientos, as also those which individuals may voluntarily place on boundaries, these not being fruit-trees, shall be exempt from all taxation.

ARTICLE 9. It remains at the discretion of individuals to place trees, in the method and of the kinds they think best, within the estates, upon which the present law has no effect.

ARTICLE 10. The provincial deputations shall also establish sufficient nurseries to line with trees the highways of the province and of the state which may be within their jurisdictions, holding responsible, under penalty of loss of their situations, the public-road laborers who neglect the planting and preservation of the trees. The ayuntamientos will do the same as regards vicinal roads already constructed under authoritative prescriptions, and moreover will set out on the squares and public places as many as they can for the adornment and health of the town. Railroad companies are under obligation to set out trees at their own expense on the boundaries of all their roads and stations. The owners of banks of river-beds, who set out trees along the limits of their properties, will likewise enjoy the benefits of article 8.

ARTICLE 11. The propagation, care, and police of the general planting of trees on boundaries, roads, highways, and water-ways belong to the administration, with aid of the facultative body. All questions between parties regarding right of property in common, of boundary-lines, or of damage to the trees, belong to the ordinary jurisdiction.

ARTICLE 12. The government will within a term of one month form the proper regulations for the fulfillment of this law.

Palace of the congress, 23th of March, 1876.

JOSÉ IGNACIO ESCOBAR.
THE MARQUES DE VIANA.
THE MARQUES DE VILLABOBAR.
ADOLPHO BAYO.
CARLOS DE SEDANO.
R. ALZUGARAY.

CULTIVATION OF COFFEE IN MEXICO.

By HON. JOHN W. FOSTER,
United States Minister to Mexico.

The total product of the coffee-crop of the world for 1874 is estimated at about 900,000,000 pounds,* of which amount the United States imported in 1875 one-third, or 317,970,665 pounds; which fact is sufficient to indicate the great interest which this country has in its production and cost.

The chief coffee-producing countries are Brazil, (whose product is about two-thirds of the entire amount,) the Dutch colonies, the West Indies, the Central and South American republics, and Ceylon.

Coffee was first introduced into Europe more than two hundred years ago, but during the last fifty its use has greatly increased, and of recent years the supply has not kept pace with the growing demand in the civilized world. In the United States the amount imported twenty years ago, in 1856, was 235,865,268 pounds, of the value of \$21,573,558.

*American Grocer, September 26, 1875.

In 1875 the amount imported was 317,970,665 pounds, of the value of \$50,591,488. But as the consumption is affected somewhat from year to year by the production, it is fair to estimate the average importation. The three years beginning with 1856 show an average annual importation of 221,800,000 pounds, of the value of \$20,700,000; and the three years ending with 1875 an average annual importation of 298,700,000 pounds, of the value of \$50,800,000. It will thus be seen that in the past twenty years the increase in quantity of imports of coffee has been only 34 per cent., which is 21 per cent. less than the increase of population, but that the increase in value has been 146 per cent.

It will be interesting to make a comparison with the importations of the other table beverage, tea. The increased amount of importations in pounds (annual average) of tea from 1856 to 1875, inclusive, has been 136 per cent., or 31 per cent. more than the increase of population, the latter being in the past twenty years 55 per cent. The import consumption of coffee and tea *per inhabitant*, estimating the population in 1856 at 27,000,000 and in 1875 at 42,000,000, was as follows:

	1856. Pounds.	1875. Pounds.	Per cent.
Coffee	8. 21	7. 11	Decrease of 13
Tea.....	. 93	1. 43	Increase of 54

Comparing the consumption of coffee and tea with the population, it is thus seen that the increased consumption of coffee has fallen behind the increase of population, while that of tea has very largely exceeded the growth of the country, and that there is actually less coffee used *per capita* than twenty years ago. The reason of this is not found in the decreased popularity of coffee as a beverage, as it holds a place in the taste of the American people much above tea; but the explanation is justly to be attributed to the growing demand for coffee throughout the world, and the failure of the production to keep pace with that demand, which has greatly enhanced the price. The price in gold of tea at wholesale is to-day as low as it was in 1860, before the civil war,* while coffee is nearly double the price of 1856-'60.

These statistics are given to show that the United States are deeply interested in the increased production of coffee, and in finding new and more accessible sources for its supply of this article, of which it is a much larger consumer than any other nation in the world.

It may be an unknown fact to many Americans that at our very doors, in Mexico, our neighboring republic, there exists the agricultural capacity to produce all the coffee that can be consumed in the United States, and of a quality equal to the best grown in any country. Mexico, it is true, is exporting very little coffee, and scarcely figures in the coffee-producing countries, but its capacity and adaptability for its production have been tested by more than fifty years of successful cultivation.

The topographical and climatic character of the country is admirably adapted for this purpose. The great Andean mountain range coming up through South and Central America, greatly depressed in the Isthmus of Tehuantepec, apparently for the passage of the commerce of the two oceans, suddenly springs up in Southeastern Mexico into lofty cordilleras, one branch of which follows close along the Pacific and the other along the Gulf coast of the country, holding up on these two arms the great table-land of the interior, thus affording every variety of production of the earth. The coffee-producing regions are found on the entire line of the sea-slope of the mountains from Guatemala on the south, on the Pacific side, for more than a thousand miles to the north, until it

* New York Post, March 29, 1876.

reaches a line in the State of Sinaloa where occasional frosts endanger the crop; and also for more than a thousand miles on the Gulf coast from Yucatan into Tamaulipas. In addition to these immense stretches of country it flourishes in the numerous and fertile valleys of the interior, wherever the great table land is sufficiently depressed to reach the level of tropical and semi-tropical vegetation.

The elevation above the sea at which it is thought coffee is most favorably grown is from 1,000 to 4,000 feet; but in Mexico it is cultivated with success at an elevation 4,500 feet, and it is found even still higher. So also it is grown at lower levels than 1,000 feet, as in various places in Mexico it is produced at the very sea-side. Off the eastern coast of Yucatan, on the island of Cozumel, coffee trees of prolific yield are growing nearly at the sea-level as well as in many other localities on both the Pacific and Gulf coasts. So that it will be seen that the area for the cultivation of coffee in Mexico is immense. The amount of its production, so far as natural capacity is concerned, need only be limited by the extent of land brought under cultivation.

As already stated, the adaptability of Mexico as a coffee producing country has been tested by more than fifty years of experience in its cultivation, which experience proves that in profit to the producer, as well as in quality of the article, this country has no superior. That it has not assumed the first place in exportation is to be attributed to other causes than the capacity of the soil, profit of the cultivation, or quality of the article—to the same causes which have retarded all commercial and agricultural development of the country. In 1818 and 1819 the profitableness of the growth of coffee in the West Indies led to the establishment of extensive plantations in the vicinity of Cordova and Orizaba, and in 1825 they were in a flourishing state. In the valleys of Cuernavaca and Cuautla, in the interior, in 1826 there were estates where there were growing as many as five hundred thousand plants.* And elsewhere in the republic much attention was given to coffee planting at that period, and great hopes were entertained that the country would soon be largely engaged in its exportation to foreign countries. But the civil disorders, which began soon after and which continued till lately, paralyzed all business enterprises, and disappointed these hopes; so that the coffee production of Mexico has been mostly limited to supplying the home demand, which is quite large, as coffee is in very general use by all classes.

During the past few years, up to the close of 1875, there have been peace and security in the country, and the cultivation of coffee has begun to increase, so that a small exportation has commenced. The statistics of the single port of Vera Cruz will show the growth of this exportation, which, although insignificant as compared with the total production of the world, still indicates a very healthy development of this industry; it ought in a few years to become very considerable:

Exportation of coffee from Vera Cruz, 1871 to 1875.

	Pounds.
Year ending June 30, 1871	672,588
Year ending June 30, 1872	1,912,020
Year ending June 30, 1873	3,909,446
Year ending June 30, 1874	4,204,446
Year ending June 30, 1875	5,373,678

The coffee exported from Vera Cruz is all grown in that State, with the valley of Cordova, on the Mexico and Vera Cruz Railway, as the chief center of its production. A brief reference to the methods of its

* See Ward's Mexico, book I.

cultivation at Cordova may be a matter of interest to the vast number of coffee drinkers in the United States, many of whom know nothing of the article except at the daily breakfast table.*

The seed or grain, which should be selected with care, is usually planted in well-prepared beds in a nursery, shaded from the sun. The young plants are transplanted at the age of one year or eighteen months to the fields or *cafetales*, which are thoroughly cleaned of all undergrowth and the soil well prepared. As the young plants are very tender, it is necessary to protect them from the sun. For this reason open forests are used, where available, and the mountain sides affording shade are utilized for coffee plantations. In open fields a growing shade must be created, which is most quickly obtained by planting banana trees, also yielding some profit from their fruit. But the best cultivators at Cordova consider this a poor substitute. One of the most intelligent planters there has set out in his coffee fields a large number of cinchona trees, (from which quinine is obtained,) which grow well in that latitude; also valuable timber trees, as the oak, walnut, &c. The second year after planting there is a very slight yield of coffee; the third year about a half crop; and the fourth year (or when the plant is five years old) a full crop is gathered.

A reasonably rich soil is desirable for coffee, and manuring pays well in the vigor of the tree and increase of yield. The distance at which plants are set out in the field is usually about three yards (or *varas*) apart each way, although often planted closer. The cultivation consists in keeping the fields clean from weeds and undergrowth and plowing the soil; in certain localities irrigation is necessary, but in Cordova, after the plants are well started in the field, this is not required; and the better class of planters give careful attention to pruning, keeping the plant or tree at the height of from 6 to 8 feet, although if unchecked it will grow to double that height.

The trees do not yield their full blossoming at one time. The first flowering is sometimes as early as December, the second about February, and the third and most abundant the last of March and the month of April. Early in April last it was my good fortune to spend several days in Cordova, in the midst of the blossoming season. The suburbs of the city in all directions are devoted to coffee cultivation. The lanes, lined on each side with *cafetales*, presented a most agreeable sight—the pure white blossoms, clinging close along the branches half covered with the bright green leaves, gave the trees the appearance of being sprinkled with snow; and the perfume of the flowers, almost equal to that of orange blossoms, loaded the air with its fragrance.

The flower falls, leaving a round green berry, which ripens in seven or eight months, changing when ripe into a red color. Each fully-formed berry contains two grains; though sometimes it contains only one grain, which is rounded or oval shaped, called by the Mexicans *caracolillo*. On account of the different times of flowering, the picking or gathering season lasts for three or four months, each tree having to be carefully gone over three or four times by hand. This is the most tedious and difficult process of the whole cultivation; it cannot be postponed, must be done carefully, and requires an extra number of laborers; but women and children can be employed at low wages.

The first process after picking is to dry the berries, which is done by exposing them to the sun, when they shrivel and change to a black

* Hon. Matias Romero, well known in the United States as the former Mexican minister at Washington, has recently written a valuable work, in Spanish, on coffee cultivation entitled, "*Cultivo del café en la Costa Meridional de Chiapas*."

color. They are then put into a mortar, and the grains hulled or beaten out with a pestle. The grain is then separated from the chaff by the crude process of fanning it out by hand or winnowing, though sometimes a fan-mill is used. The coffee is afterwards picked over carefully, grain by grain, by hand, and selected; and it is then ready for sacking and the market. Up to the present the "doctoring" process of artificial coloring or bleaching, as in some countries, has not been resorted to here. The process of curing, after gathering the crop, is in a most primitive state in Mexico. It presents a fertile field for Yankee ingenuity to invent instruments and methods to facilitate the process, or for enterprise to avail of the inventions in use in other countries. And although it has been grown here for so many years, the coffee cultivation in Mexico may yet be considered in its infancy, as it is only beginning to receive the attention of intelligent and scientific cultivators. So that great improvements may be anticipated both in the cultivation and curing.

Experience has, however, proved that it is a *certain* and *reliable* crop. So far, its cultivation at Cordova has developed no disease of plant or berry. Insects do not attack it. It is very little affected by the climate, as in the locality of its production there is no frost; and although great drought may diminish the crop, it does not destroy it. The flower when in full bloom is sometimes broken off by severe winds, but this seldom diminishes the yield. The crop is also clean and comparatively easy to cultivate. After the *cafetal* is once in full bloom, the cultivation is easy. Only at the picking season is there much urgency required. Once gathered, the crop can be cured and prepared for market leisurely and at the planter's convenience.

The most prominent objection is that so much time is lost before a profit begins to be realized. If a planter commences with sowing the seed, he must wait more than five years before he obtains returns upon his investment; or four years if he plants from the nursery, as the first year's crop barely pays more than the cost of cultivation and curing. But as compensation for this, a plantation once established yields a never-failing crop, without renewal, anxiety, or uncertainty, for a lifetime. And the profit in Mexico during the past few years has been about 100 per cent. over the cost of cultivation, and 10 per cent. interest on the capital invested. The period the trees will continue bearing is variously estimated, but the usual estimate is from twenty to twenty-five years. There are, however, trees now growing in Cordova sixty or seventy years old, remains of neglected and abandoned plantations, which by pruning and cultivation are yielding a fine crop. An intelligent American planter in that valley claims that with attention and care plants ought to continue bearing vigorously for fifty years. Another important feature of coffee-planting in Mexico is that the locality of its cultivation is usually both healthy and attractive, elevated above the fatal diseases of the tropics and in the presence of the most beautiful scenery. The valley of Cordova, for instance, is among the foothills of the great mountain of Orizaba, whose peak is covered with eternal snow, in a rich semi-tropical vegetation, and with a remarkably equable climate, the elevation being 3,000 feet above the sea.

The average yield per tree at Cordova is estimated at about one and a half pounds, although it is claimed that, with intelligent culture, pruning, and manuring, the average yield in that valley may be increased to three pounds per tree. It is not uncommon to find trees yielding from five to seven pounds, and, in very exceptional cases, from twenty-five to fifty pounds each. With the trees, planted three yards apart each way, with the above-stated average, it is easy to estimate the yield

per acre. It is unsafe to give a detailed calculation of the outlay required in establishing a plantation or *cafetal* up to the time of yielding the first paying-crop, as much depends both upon the locality and the intelligence and economy of the planter, so that published estimates are apt to mislead. It may be stated, however, that, after the plants begin to bear a full crop, the cost of annual cultivation, up to sale in local market, is from six to seven cents a pound.

It is very difficult to give any definite idea of the price of land in the coffee-growing regions. The average price, as per sales which have been made in the valley of Cordova beyond the vicinity of the city during the past two years, has been about \$10 per acre; and, at points out of the reach of the railroad in the same State of Vera Cruz, sales have been made at \$5 per acre, or even less. But this has been in a time of great business depression; and, with a revival of commerce and a growing demand for coffee-lands, the price would very soon advance, possibly 50 or 100 per cent.

In what has preceded I have referred particularly to the coffee region having the valley of Cordova for its center, for the reason that it is the locality at present of the greatest production in the republic, and is most accessible to the American market. But there are several other localities in the country where the cultivation is receiving considerable attention, and is assuming some importance in exportation. One of these localities is the district of Soconusco, in the State of Chiapas, immediately upon the borders of the republic of Guatemala. Hon. Matias Romero owns a plantation in that district, and the recent revival of this industry there is almost entirely due to his encouragement. Several Americans and other foreigners have located there, and are engaged in planting, and quite a number of the resident-proprietors have embarked extensively in this cultivation. Among the special advantages presented in this district is the cheapness of land and labor. Public or government lands, which are subject to entry by foreigners, can be taken at from \$20 to \$25 per caballeria, (a Spanish measure of about 105 acres.) Private lands have been sold at from \$50 to \$100 per caballeria; but native land-owners here, as elsewhere in Mexico, have very little disposition to part with their estates. Continued success in coffee-culture and a growing demand will largely increase the price. Wages are reported at 25 cents per hand a day; but, of course, this very low price could not be continued with a greatly increased demand for labor. The chief impediment to the development of this industry in Soconusco is the fact that this district is a disputed territory, claimed by both Mexico and Guatemala, and until this vexed question is settled the tenure and protection of property will remain insecure.

The valley of Uruapan, in the State of Michoacan, has great celebrity for its fertility, and for the superior quality of the coffee grown there. But the most noted region, especially for the excellence of its coffee, is the State of Colima, on the Pacific coast; its product being so highly esteemed that it commands a fabulous price in the city of Mexico and more distant places of the republic. The planting of coffee began in Colima in 1858, to a very limited extent, with plants obtained from Costa Rica. The article produced was found so superior to any other grown in the country, sample lots sent to private parties in Europe being pronounced equal to Mocha, that in 1873 quite an impetus was given to the cultivation, and since that year over one million plants have been set out, which are now beginning to bear; and the planting continues to increase, coffee promising to become the principal article of export and a fertile source of wealth to the State. The demand for

all thus far produced is so great that it commands in large lots 27 cents per pound at the plantation, mainly for consumption in the interior, a small portion only being shipped to Germany, by resident German merchants, on private orders. The American consul at the city of Colima places the cost of land suitable for coffee-plantations, including water for irrigation, at from \$15 to \$30 per acre, depending on location and climate. He states that a plantation containing 100,000 plants four years old (when the first crop is realized) costs from \$10,000 to \$14,000; the proceeds the first year being about 50,000 pounds, and from the fifth year onward 100,000 pounds or upward; and he estimates the average net yearly gain at \$20,000.

Colima and some other States have passed quite liberal laws for the encouragement of coffee-cultivation, offering liberal premiums for the largest crops produced, and exempting coffee-lands from all taxes.

With peace in the country and protection assured, this industry would offer great attractions for foreign immigration and capital. And for the Mexican farmer and land-owner there is no more certain or profitable enterprise in which they can engage. To the common people, the poor, the Indian race, it presents the most desirable source of industry. It can be planted in small lots, garden plots or patches. It requires no costly machinery, like sugar, to prepare it for market. Women and children can attend to the greater part of the work. It is always reliable and commands a ready sale, for cash, at good prices. It will be a happy augury for the country to see the lower and laboring classes more generally engaged in its production, as it will give them a permanent property-interest for peace and against revolutions, and will be for them and the country a most fertile source of wealth.

Mexico for three centuries past has been famous for its great production and exportation of silver. But in coffee alone it possesses a far greater source of wealth and prosperity. Its natural capacity for its production is at least equal to that of Brazil, yet the value of the coffee annually exported from Brazil is more than three times as great as that of the silver and gold product of Mexico.

FACTS FROM VARIOUS SOURCES.

DISTANT TRANSPORTATION OF FRESH MEAT.—A correspondent of the American Farmer at Paris reports that a company formed for transporting meat by "the Tillier process" would send its first ship fitted up for that purpose to La Plata for a cargo in April. By means of metallic ether, aided by "ingenious generating cold machinery," maintaining the temperature at the freezing-point and dry, Tillier "has conserved meat perfectly fresh and savory, save a loss of 10 per cent. in weight, for fifty-seven days." The voyage from La Plata to France is expected to be made in thirty days at most. He reports that the daily consumption of fresh meat in France is 4,000 tons.

FRUIT-GROWING IN MARYLAND.—The following statements are condensed from a recent report by Mr. W. D. Brackenridge to the American Pomological Society on the progress and extent of fruit-culture in Maryland: It is estimated that on the Eastern Shore sixty thousand acres are planted in peach-trees, and that the yield the present season for the market will be 5,000,000 bushels. The season of ripening extends from the middle of July to the 1st of October. Some of these

orchards are over twenty years old, and still continue in a healthy condition. The stimulants used thus to maintain the trees are liberal applications of barn-yard manure or ground bones to the extent of 1,000 pounds to the acre. Sometimes muriate of potash and other fertilizers are applied, while the surface of the ground is kept open by frequent plowing and harrowing during each season; judicious pruning and shortening-in is considered essential to the healthy condition of the orchard. The usual remedy for the peach-borer, or worm, is to use the knife freely, and then apply a shovelful of slacked lime on the surface in close contact with the tree.

The cultivation of pears has increased very considerably within a few years. Orchards of 4,000 trees in bearing are now to be found. As a rule, good growers, with proper treatment, are found quite remunerative. The greatest drawback is the blight, for which no remedy has yet been discovered. Dwarfs are much grown on the Eastern Shore and bear very heavy crops.

Of apples, "only the very superior early and late kinds are remunerative." Plums are but little cultivated, owing to pervading and destructive attacks of the curculio and black knot. Of cherries, the Early Richmond is the most popular for the market. The only disease to which cherries are subject in Maryland is the black knot, though a black aphid, in the early season, frequently attacks the young shoots. Grapes have heretofore been chiefly cultivated for table-use; but a few vineyards have been started with a view to wine-making. The principal varieties selected for this purpose are Ives Seedling, Clinton, Catawba, Delaware, and Concord.

BRAZILIAN COFFEE.—Dr. J. Moreira, of the Brazilian commission at the Centennial Exposition, has published a small pamphlet on the coffee of Brazil, which traces that branch of production to a few seeds brought from French Guiana about the middle of the last century. Its culture began in the Amazon region, and passed thence to Maranhão, subsequently to the province of Rio Janeiro, and finally to all the other provinces. Some of these regions are now covered with immense forests of coffee-trees, where improved processes of culture and new machinery have greatly perfected the growth and preparation of this berry for market.

The coffee-tree in other countries is supposed to require an annual temperature varying between 62° and 66° Fahrenheit; but in Brazil no such limitations are noticed; it seems to grow almost equally well in all latitudes of the empire. The virgin soil of the cleared forest is planted with tress without special regard to its composition, but, in old lands, soils composed of two-thirds red clay and one-third of deposit are most desirable; reddish-yellow argillous soils on hill-sides, at a distance from the sea, are preferred. The taste and aroma of the coffee grown on bottoms is less agreeable than of that on the uplands. Trees are now propagated almost exclusively from the seed. The seed-beds are prepared in August, September, or October, and in a year the bushes are set out in the orchards, at the rate of over two thousand trees per acre, the interval of the trees in the rows being about 5 feet. The trees begin to bear at three years, but their average productive power is not realized till after five years from planting. The average annual yield is about twelve hundred pounds per acre. Each tree planted in rich land may be reasonably expected to average twenty pounds of fruit, but the general average per tree of coffee ready for market has a wide range, from one to seven pounds. One laborer can take care of twelve hundred plants.

On the high lands the gathering of the crop begins in April or May, and continues till September. We should remember that the greater part of the Brazilian Empire lies south of the equator, and the whole of it south of the thermal equator, consequently, its seasons are antipodal to ours. The berries are dried mostly by exposure to the hot sun, though some farmers employ furnaces. Terraces or sheds, with an elevation in the center, are covered with the fruit and kept exposed until perfectly dry. This process produces the thick-hull, or sun-dried coffee. Some farmers take the berries immediately to the press, and after thoroughly pressing and washing them, expose them on terraces or sheds till perfectly dry. Others, again, keep them steeped for several days in water prior to drying, in order that the hulls may come off more readily. By the last two methods the washed or pulpless coffee is produced. The hulling process is performed by machinery, the cylindrical hullers being preferred to the disk hullers, as the former do not crush the seed. American machines, especially those of Ledgerwood & Co., are mostly used in hulling, screening, and polishing the berry. Some of these machines have been known to clean over eight thousand pounds of coffee in ten hours. The Albion coffee-huller cleans from twelve hundred to fifteen hundred pounds in twelve hours.

Coffee is mostly exported from four leading ports: Rio de Janeiro, Santos, Bahia, and Ceará. Rio de Janeiro coffee, either upland or bottom land, is graded as superior, good firsts, ordinary firsts, low firsts; good seconds, and low seconds. Santos coffee, when well prepared, is considered as first class. That of Ceará is about equal to Lagnayra coffee in European markets. Bahia coffee, though inferior, finds access to some markets, and is graded S, SS, and SSS.

England and Italy prefer the aromatic washed coffee of Brazil; Russia, Denmark, and part of Germany, the bitter sun-dried article. Brazil furnishes more than half the coffee consumed by the world's population, and much of it is sold under brands of Mocha and Java coffee. The popular preference for these Asiatic brands, then, has but a slender basis of fact upon which to rest, and is very apt to be imposed upon by the Brazilian product, the qualities of which, by their growing excellence, tend to keep alive this popular prejudice. In 1800 Rio Janeiro exported only 10 sacks; in 1820, 97,500 sacks; in 1830, 391,785 sacks; in 1840, 1,068,418 sacks; in 1850, 1,343,484 sacks; in 1860, 2,127,219 sacks; in 1870, 2,209,456 sacks; in 1874, 2,673,281 sacks. The exports of the province of Bahia rose from about 100,000 pounds, in 1810, to nearly 120,000,000 in 1869-'70. From 1869 to 1872 Santos, in the province of San Paulo, exported over 200,000,000 pounds. In 1870 the province of Espirito Santo exported 1,150,000 pounds. The province of Ceará raised its exports from about 57,000 pounds, in 1839, to 2,703,000 pounds in 1870-'71. These figures show an immense productive power in this interest, to which much capital and enterprise have been attracted from the United States.

LATE ENGLISH AGRICULTURAL EXPERIMENTS.—Professor Wrightson, of the Royal Agricultural College at Cirencester, gives the following results of experiments on the college farm under his direction in the culture of swedes:

1. That poor land and in poor condition derives the greatest benefit from artificial dressings.
2. That land in high condition has been proved, in many cases, to derive little or no benefit from the use of artificial dressings.
3. That land in this neighborhood appears to be satisfied with moderate dressings, and the use of heavier dressings is not attended with commensurate results.

4. That 3 cwt. of ordinary mineral superphosphate per acre has given the best economic results during several year's experience extending over hundreds of plots.
5. That guano, nitrate of soda, organic matter, and even farm-yard dung diminish the germinating power of swede seed, and cause a blankiness in the crop when they are brought in contact with the seed.
6. That guano and nitrate of soda applied to the growing swedes increase the crop, but scarcely to an extent to warrant their general use.
7. That the average increase in swede crops from the use of 3 cwt. of superphosphate amounts to 5 tons 6 cwt. per acre. That in some cases the increase has been *nil*, while in others it has been as much as 14 tons per acre.

Among the deductions from his experiments in grain-growing Professor Wrightson states the following: 1. Wide drilling and thin seeding in his neighborhood is more successful with barley than with wheat. 2. That barley may be sown 16 inches apart, and with half the usual quantity of seed without injuring the growth.

DOES BUCKWHEAT POISON SHEEP?—A farmer of Kent County, England, at the close of the dry, hot summer of 1870 had 378 lambs on his farm which, in consequence of the drought and failure of the grass-crop, was heavily overstocked. These lambs were, at the close of the season, in very poor condition, and, to bring them up again, were placed upon a field of buckwheat. They soon began to show signs of giddiness, and even intoxication, fighting and butting each other in a very unlamblike manner. Soon their faces, heads, and especially their ears, were covered with ulcers. The eyelids swelled in many cases, causing total blindness, and in others the eyes were totally destroyed by ulceration. A copious discharge of pulverulent mucus from the nose, swollen lips, and cessation of appetite marked the course of the disease. The sun and the flies began to terrify the afflicted animals, and several deaths occurred. That the disease was not variola was shown by the fact that there was no eruption inside the thighs or on other hairless spots. Of 57 lambs not placed in the buckwheat-field not one was affected, all were perfectly healthy. To test the contagiousness of the disease several affected rams were turned into the same inclosure with perfectly sound ewes, and though they copulated and lambs were the result, no trace of disease was found upon either the mothers or the offspring. The farmer is fully convinced that the disease was caused by the poisonous quality of the buckwheat, which had greater power in consequence of the low vitality of the animals. The ulcerations were dressed with a weak solution of carbolic acid, and small doses of ferri sulph., gentian, and spirits of terebinth were administered. The buckwheat was probably nearly ripe, or at least in full flower, at which period it is known to contain an element of an intoxicating character. It is said also to produce erysipelatous eruptions in different kinds of animals, with symptoms of cerebral congestion.

HORSE POISONING.—The Newark (England) Advertiser states that in some English agricultural sections a very odd notion has taken possession of grooms that a mixture of arsenic, copperas, and vitriol, administered internally, will brighten the skins of horses and give them a beautiful glossy surface. The dose is generally given in small doses and consequently the injurious influence is more insidious in its advances. But in some cases reckless ignorance has transcended the bounds of common prudence, and several valuable horses have died from direct poisoning. One farmer at Besthorpe, after losing five fine cart-horses, instituted a post-mortem examination conducted by a skillful veterinary surgeon. The liver was found to be rotten, the kidneys in a state of advanced decomposition, the lining membrane of the stomach eaten

away and the heart flabby. Traces of poison were easily detected. The groom, on being interrogated, confessed that for two months he had been giving to each horse twice a week a dose of powders sufficient to cover a half-penny, the powder being compound of arsenic and copperas. The lazy groom doubtless calculated on saving himself labor in currying the animals by means of drugs which should make the animals' coats clean and bright. There is a tendency among grooms of horses kept for pleasure-carriages and in livery-stables to use nostrums, the effect of which cannot be otherwise than destructive upon the health and vitality of the animals. Farmers generally are very little disposed to such destructive quackery.

IRISH CATTLE-TRADE.—Official statistics show that the average aggregate value of the cattle, sheep, and swine furnished by Ireland for the English markets is over £12,000,000 or \$60,000,000. Complaints of disease among Irish cattle have, upon investigation, resolved themselves into three categories: 1. Injudicious and cruel driving; 2. Filth-saturated holds, cattle-lairs, and disease-infected railroad-trucks; 3. Exposure, starvation, and consequent exhaustion. A reform in the methods of transportation is loudly demanded. A strong movement is on foot to compel steamer and railway companies to observe some sanitary regulations; to cleanse their trucks; to provide ample room for the comfortable shipment of animals, and to apply disinfectant chemicals to remove the germs of organic disease.

GROWING WOOD FOR FUEL.—A Canadian farmer, about twelve years ago, planted six American cottonwood-trees, and one silver Abele poplar, on seven square rods. Lately cutting them down and preparing them for fuel, he realized four cords of nice wood. An acre at the same rate would have yielded eighty cords.

CROPS OF INDIA.—The northwest provinces of India are almost exclusively agricultural. The staple crop is wheat, which is often grown year after year on the same land till the average falls to 3 or 4 bushels per acre. The late crop of the Indian Empire was about average, or 12 bushels per acre. A field of good land, cultivated by a native, yielded 17 bushels of grain and 14 cwt. of straw per acre; but this is a very favorable specimen of Hindoo farming. A field of poor land in the vicinity cultivated by an Englishman, with an English plow, averaged 19 bushels per acre of grain and 17 cwt. of straw. A third field, manured with crushed bones, produced 28½ bushels per acre of grain, besides 30 cwt. of straw. A fourth field, fertilized with a little stable-manure and village-sweepings, averaged 36 bushels of grain and 48 cwt. of straw per acre. The third and fourth fields were broken deeply with an English plow, and subsequently widened with a Hindoo plow, which makes a tolerable cultivator.

Industry being but little diversified, home markets are few and unimportant, and access to foreign markets somewhat precarious. This causes low prices and consequently great misery among the cultivators, whose returns are insufficient for their taxes and living-expenses, small as the latter are. The large crop of 1875 cut down prices of wheat to an average of 55 cents per bushel in twelve northwest provinces, against 78 cents in 1874. The Indian government has contemplated the revival of a former practice of the East India Company, viz, to make remittances for home charges in England in wheat instead of cash. The effect of government purchases would be to raise the local markets to a scale of living-prices.

The natives succeed very poorly with root-crops, their turnips being

generally dry, stringy, and indigestible. An English farmer on the same soil raised 11 tons of very superior turnips. The above are but specimens of the difference between English and Hindoo farming generally.

FRENCH CROPS.—From recently-published statistics it appears that in 1820 land in France sown in grain averaged about $10\frac{1}{2}$ bushels per acre. In 1874 the average yield is stated at $21\frac{1}{2}$ bushels, or a doubling of production in half a century. As the French population doubles itself only in one hundred and sixty years, the above fact would indicate that food products are increasing faster than the mouths that are to consume them. This increase of production is due to the adoption of more scientific methods than those prevailing a half century ago. In potatoes, however, the statistics of 1874 show a smaller increase. In 1820, the average product was 79.3 bushels per acre; in 1874, 120.8 bushels. In 1815, 11,341,500 acres were sown with grain, yielding 119,085,750 bushels; in 1874, 17,080,240 acres yielded 386,517,625 bushels. The price of wheat in 1874 was 44s. 6d. per quarter, or about \$1.35 per bushel; in 1874 it was 58s. 5d. per quarter, or about \$1.76 per bushel.

WASTE OF FERTILIZING PRINCIPLES.—From a series of analyses made by M. Boussingault, of the French Academy of Sciences, it appears that a cubic meter of water passing under the Pont d'Austerlitz, in the heart of Paris, contained one-ninetieth part of an ounce of ammonia, and one-twenty-fifth of an ounce of nitric acid. This was during the severe spring-flood of 1876. When the river is at its average stage there is but a third of this quantity of ammonia and a fourth of the nitric acid in a cubic meter of water. The increased amount of these elements during the flood is due to the fact that the swollen waters covering a wider portion of the soil extract more of its fertility. The water of the Nile is said to be richer than that of any other river on earth in these fertilizing matters, containing about one-seventh of an ounce per cubic meter of nitric acid. At the date of Boussingault's observation the Seine was running 143,510,400 cubic meters in twenty-four hours, and in this mass about 47 tons of ammonia and 182 tons of nitric acid were swept into the ocean.

FOREST-PLANTING IN FRANCE.—The past spring has been very favorable to the large areas in France lately planted in forests. It is stated that 5,000,000 hectares or 12,350,000 acres—about half the area of Ohio—have become unproductive as agricultural lands. Pine-trees without any cultivation and a very inexpensive supervision can be made to grow upon these barren acres, netting about \$2.50 per acre of annual profit. This would add to the productive capacity of these lands about \$30,000,000 per annum. Other trees have been planted with similar economic results, and now landed proprietors are looking to tree-planting as a means of utilizing their unproductive acres.

SPARE THE BIRDS.—M. Waddington, French minister of public instruction, at the request of his colleagues, the ministers of agriculture and of the interior, has issued a circular to the departmental prefects detailing the injuries suffered by growing crops from the ravages of destructive insects, and enforcing the necessity of protecting those classes of insectivorous birds which prey upon them. The same fact is noticed and deplored in France which has been recognized by intelligent agriculturists in this country, that there exists in the minds of the people an unfortunate and inveterate tendency to destroy these birds.

Their kind offices in destroying vermin are in many places stupidly ignored, and they are pursued with relentless destruction as public enemies.

In order to disabuse the minds of the rising generation of these prejudices, and secure proper protection for the "farmer's friends," the prefects are directed to bring this matter to the attention of superintendents of instruction and teachers, and cause them to show their pupils how to distinguish injurious insects from harmless ones, and to indicate the classes of birds which prey upon the former. The protection of the latter is to be impressed upon the minds of youth as a public duty, and every effort is to be made to secure a spontaneous and hearty co-operation with the authorities in this great work. But in case such methods should fail, the prefects are reminded of certain statutory enactments, enforced by severe penalties, which are to be clearly indicated to the pupils, and to be rigidly enforced by the relentless prosecution of all infractions of the same. In some communes protective societies have been formed among the pupils of different schools. Good results have already flown from this new organization, which promises to extend itself throughout the republic.

UTILIZATION OF TANNERY REFUSE IN FRANCE.—The tanning industry is largely developed in Western France, more especially in Brittany. An attempt has been made of late to utilize the organic residuum of the tan-yard. Two classes of organic refuse, animal and vegetable, are distinguished in these tanneries, the former being much the more valuable as fertilizers. The process of their elimination from the leather embraces, first, subjecting the hides to the prolonged action of milk of lime. The hair is then removed, and necessarily retains a large mixture of lime. The patches of fleshy tissue adhering to the inner side of the hide and its external cuticle are next removed and mingled in heaps until an opportunity for selling them presents itself. These heaps contain about $75\frac{1}{2}$ per cent. of water, and $24\frac{1}{2}$ per cent. of dry matter. The dry matter, upon separate analysis, yields $84\frac{1}{2}$ per cent. of organic matter and $15\frac{1}{2}$ per cent. of mineral matter. The mineral matter averages about $3\frac{1}{2}$ per cent. of silica, $17\frac{1}{2}$ per cent. of phosphate of lime, 69 per cent. of lime, and 10 per cent. of various salts. The whole mass of organic and mineral matter in the heap contains about 7 per cent. of nitrogen. As the heaps generally remain undisturbed for two or three months, they exhale one-fifth of their water, and three-tenths of their nitrogen. This is due to the rapid decomposition of their animal matter under the corrosive action of the lime. It is then sold as manure at 3 to 5 francs (60 cents to \$1.00) per cubic meter, (1.3 cubic yards.) It is beneficial to fruit-trees, and is valuable on any non-calcareous land, but it is most speedy on light soils, where its composition is most speedily affected. The School of Irrigation at Lézardeau have tried it with excellent results, the nitrogen enriching the soil, and the lime benefiting vegetables. It also gives a superior quality to hay. If not in an advanced state of decomposition before application to the meadow the hair will remain to be gathered up with the hay, with which it will be gathered up and swallowed by the animal, in which case it cannot fail to injure the digestive apparatus. It is thought best to mix it with farm-yard manure.

The vegetable residuum of the tanning process is derived mainly from the bark which furnishes the astringent principles. The tannin combines with the tissues creating a composition which resists decay and furnishes a serviceable fabric for boots, shoes, saddlery, and other branches

of manufacture. Great quantities of bark are used, and when once deprived of their astringent principles are of no further use in the manufacture of leather. It is called tan-bark, a very spongy and fibrous material absorbing a large amount of water. This property makes it especially fit for litter of farm-stock, especially in localities where other material is scarce and dear. The water absorbed in the vat exhales more or less rapidly in proportion to the dryness of the weather, the season of the year, and the period of exposure. Its matter fully dried contains 94.9 per cent. of organic and 5.1 per cent. of mineral matter, the latter in about the following proportions to the whole, viz: Potash, 0.5 per cent.; soda, 0.2; lime, 3.7; magnesia, 0.2; phosphoric acid, 0.3; sulphuric acid, 0.1; silica, 0.1. When mixed with wheat or oat straw it will absorb more than double its weight of water. It is light, of easy transport, and cheap. The straw tends to correct its acidity, which may be further neutralized with lime or ashes; the last mixture greatly facilitates its decomposition. It is most useful when mingled with the animal refuse of tanning. This combination has been found excellent in horticulture, as it checks evaporation and prevents the desiccation of the soil. The use of this material indicates the transfer of a vast mass of what was generally considered worthless matter, to the class of excellent fertilizers.

AGRICULTURAL EDUCATION IN GERMANY.—The reported present status of agricultural education in Germany, as fostered and controlled by the imperial government, embraces the following facts and features. The system includes agricultural common schools, middle schools, and academies; and from these, an agricultural course in the universities. The course of instruction in the common schools embraces theoretical and practical lessons in agriculture; veterinary lessons and demonstrations; surveying, and something more of scientific instruction than is imparted in other elementary schools. The middle schools teach arithmetic, history, and geography; the English, French, and German languages, chemistry, physiology, botany, and zoology; agricultural management in general, with lectures on veterinary treatment, drawing, building, and agricultural laws. These two classes of agricultural schools are especially designed to impart the best practical education for their vocation, to those who, without higher advantages, are to become small farmers or overseers of small farms. Accordingly, in connection with their studies and under direction of qualified teachers, they are required to practice all kinds of farm-work, in order that they may acquire practical judgment and skill for doing the same themselves, or directing laborers under them to do it, in the most approved and profitable way. There are scattered through the empire something over 150 of these two classes of schools, though some of them are limited in the course of instruction to specialties, as vine and fruit culture, horticulture, bee-keeping, &c. The pupils receive board and lodging in the establishment; each pupil is required to pay only \$55 a year, the state paying the remainder.

There are in the empire six agricultural academies; located at Eldena, Proskau, Popplesdorf, Munich, Tharand, and Hohenheim. Connected with these academies are lands on which the students are given demonstrations and training in experimental processes, in addition to instruction in all sciences related to agriculture.

In the universities all instruction to agricultural students is theoretical, the prevalent idea in late years being that it is better for such students, after gaining a good preparatory education, to spend a few years in practical farming previous to theoretical instruction in the

university. There are nine universities which have agricultural departments; those at Berlin, Halle, Göttingen, Königsberg, Leipzig, Heidelberg, Jena, Gießen, and Kiel. Students in the agricultural course, may, if they choose, hear the lectures in all the other branches. The agricultural course embraces instruction on the following topics: Physiology, history of civilization, of agriculture, and of agricultural literature; universal arithmetic, geometry, and geodesy; experimental physics, chemistry, mineralogy, botany, and zoology; national economy, taxation of farms, agricultural management, and book-keeping; the science of finance, agricultural statistics, and agricultural and commercial laws; general land-tilling, special plant-raising, cultivation of meadows, horticulture, wood-culture, the breeding, keeping, feeding, and veterinary treatment of live-stock, wool-growing, and horse-shoeing; agricultural machinery and implements; surveying, leveling, draining, and building; practice in chemical and physiological laboratories, demonstrations and dissections in veterinary clinics and anatomy, and in draining and estimating soils.

In addition to, and disconnected with, the institutions for agricultural education, are about thirty experimental stations. These are designed, first, to protect the farmers from imposition in buying chemical or other artificial fertilizers, by testing them, as offered in the market, and exposing and prosecuting all frauds, either in the manufacturer or vender; second, to test chemically the properties of different soils, and determine to what crop they are best adapted, or what ingredients they are most deficient in; third, to determine, by experiments in feeding farm-animals, how to produce the most meat, fat, milk, butter, wool, &c., with the least cost or waste; and, fourth, to ascertain the sources and habits of worms, insects, and diseases injurious to plants, and to promulgate preventives and antidotes for the same.

FOREST AREA OF GERMANY.—The area of Germany comprises 54,102,769 hectares, (or 133,693,352 acres,) of which 13,940,541 are in woodland, or about 25.7 per cent., making the area per capita .348 hectare.

The distribution and percentage of woodland are as follows:

	Hectares.	Per cent.
In Prussia	8,137,353	23.4
In Bavaria	2,596,831	34.4
In Saxony	472,419	31.6
In Württemberg	595,102	30.5
In Baden	510,924	33.4
In Hesse	240,083	31.2
In Mecklenburg-Schwerin	163,567	12.2
In Saxony-Weimar	90,937	25.0
In Mecklenburg-Strelitz	57,949	21.3
In Oldenburg	44,793	7.0
In Brunswick	114,520	31.0
In Saxony Meiningen	93,426	37.7
In Saxony Altenburg	39,815	30.1
In Saxony Coburg-Gotha	59,330	30.2
In Anhalt	55,851	21.0
In Schwarzburg Rudolstadt	38,597	39.9
In Schwarzburg Sonderhausen	25,223	29.3
In Waldeck	44,407	39.6
In Reuss, (old line)	11,462	41.7
In Reuss, (new line)	34,117	41.3
In Schaumburg Lippe	8,682	19.6
In Lippe	33,936	29.9
In Lübeck	3,028	16.9
In Bremen	167	.6
In Hamburg	697	1.7
In Alsace-Lorraine	451,313	31.1

In the distribution of the kinds of wood the pine and fir are found in the south of Germany, oak and beech in the west and southwest, and the Scotch fir in the north and northeast, while Central Germany, to a greater or less degree, contains all these varieties.

Since 1831 the forest area of Prussia has diminished about 5 per cent. ; in most of the other German States a barely appreciable diminution has taken place, while there has been a steady increase in Bavaria, Baden, and Saxony. On the whole, Germany has wood enough to meet domestic demand for many years to come.

PRODUCTION OF SALT IN GERMANY.—By the discovery of new salt-mines and a more vigorous development of the old, the production of salt in the Zollverein states of Germany during the decade from 1860 to 1870, increased 110 per cent. The amount of mineral salt obtained in 1860 was 112,803,429 hundred-weights against 783,495,100 in 1869, or an increase of 594 per cent. The yield of kitchen-salt for these two years was, respectively, 555,732,922 hundred-weights against 618,664,221, or an increase of 11 per cent. Germany, with this increased production, is now in condition, not only to meet domestic demand, but to export great quantities. The amount of salt exported in 1869 was 159,267,468 hundred-weights. The home consumption for this year amounted to 35 pounds per capita against 21 in 1860. This is owing to the increasing demand for salt for industrial and agricultural purposes. The average amount for table use per capita is about $17\frac{1}{2}$ pounds a year.

THE AUSTRO-HUNGARIAN EMPIRE.—From an official publication of the Austro-Hungarian commission at the Centennial, it appears that this nationality is described in the Imperial writ of November 14, 1868, as the Austro-Hungarian Empire, or Austro-Hungarian Monarchy. It is a unique political organism, embracing two groups of subordinate states united on different principles. The Austrian state territory, or western half of the empire, recognizes Francis Joseph as Emperor of Austria; the Hungarian state territory, or eastern half of the empire, knows him as King of Hungary. The respective areas of these two sections are as follows:

AUSTRIAN STATE TERRITORY.

	Square miles.
Archduchy of Austria, Lower	6,533
Archduchy of Austria, Upper	4,559
Duchy of Salzburg	2,723
Styria	8,533
Carinthia	3,942
Carniola	3,795
Principality of Goritz and Gradisca, Margraviate of Istria, and city of Trieste	3,036
Principality of Tyrol and Vorarl- burg	11,144
Kingdom of Bohemia	19,741
Margraviate of Moravia	8,447
Duchy of Silesia	1,956
Duchy of Bukowina	3,971
Kingdom of Dalmatia	4,861
Kingdom of Galicia and Lodome- ria	29,829
Total western half	113,070

HUNGARIAN STATE TERRITORY.

	Square miles.
Kingdom of Hungary	85,668
Kingdom of Croatia and Slavonia	8,972
City of Fiume	6
Grand Principality of Transyl- vania	20,850
Croato-Slavonian border district	7,716
Total eastern half	123,062
Add western half	113,070
Total area of monarchy ..	236,132

The Austrian state territory is governed by a general legislative body, called the Reichsrath, a local autonomy being exercised by provincial diets in the subordinate states. The Hungarian state territory is under

the jurisdiction of the Reichstag, the kingdom of Croatia and Slavonia having a diet for local legislation. The legislative body of the whole monarchy is composed of sixty delegates from the Reichsrath and as many from the Reichstag, two-thirds of each delegation being elected by the popular branch of the legislature, and the other third by the hereditary branch.

The total area of the monarchy is less than that of Texas. Hungary proper is somewhat larger than Kansas or Minnesota; Upper and Lower Austria together are less than Maryland; the kingdom of Galicia is not quite equal to Maine; Transylvania is considerably less than West Virginia.

Next to Switzerland, Austro-Hungary is the most broken country in Europe, three-fourths of its territory being hilly or mountainous. Its river system is very extensive, the Danube alone, with its tributaries, draining over two-thirds of the territory. The Adriatic drains over six hundred miles of the coast, not including islands. The climate presents a wide range of variation, corresponding to latitude, elevation, and local influences. In the south, rice, figs, olives, and other semi-tropical plants are grown, while grapes and maize are produced in nearly all parts of the empire.

The population of the monarchy, exclusive of the regular army, at the close of 1869, was 35,634,858, or nearly 151 per square mile; that of the western half, 20,217,531, or not quite 170 per square mile; that of the eastern half, including the dependencies of the Hungarian Crown, 15,417,327, or over 125 per square mile. The most densely peopled provinces are those of Lower Austria, Bohemia, and Silesia, averaging over 260 persons to the square mile. Of the whole population, 9,003,700, or over 25 per cent., are Germans; 6,550,000, or over 18 per cent., are Czechs, Moravians, and Slavonians; 5,705,800, or over 16 per cent., are Magyars; 2,685,600, or over $7\frac{1}{2}$ per cent., are Romanians and Poles, in about equal proportions; Croatians and Servians constitute about $8\frac{1}{2}$ per cent., and the Rutherians nearly 9 per cent.; Italians number 588,000, Slovenians 1,254,200, and Jews 1,372,300. The population resides in 927 towns, 2,039 boroughs, and 73,252 villages. Vienna has over a million inhabitants. Nineteen towns in the Austrian territory have between 20,000 and 50,000, and 43 between 10,000 and 20,000, with several very large cities. In the Hungarian territory, are Buda-Pest with over 300,000, and several other large cities; 27 towns have between 20,000 and 50,000, and 54 others over 10,000.

The religious statistics show 23,750,776 Roman Catholics, 3,918,000 Greek Catholics, 8,140 Armenian Catholics, 3,037,176 schismatic Greek Catholics, 1,741 schismatic Armenian Catholics, 1,356,316 Protestants of the Augsburg persuasion, 2,128,349 of the Helvetic churches, 1,372,333 Jews, and 7,419 Mohammedans and other sects.

Over four-fifths of the soil is occupied either with agriculture or forests. The latter cover 28.34 per cent. of the whole monarchy, the largest proportion, 44.95 per cent., being in Styria, and the smallest, 21.39 per cent., in Dalmatia. The acreage devoted to general crops is 31.50 per cent. of the whole; vineyards, 0.94 per cent.; meadows and gardens, 12.87 per cent.; pastures, 14.37 per cent.; forests, 28.34 per cent.; barren land, 12 per cent. The most fertile grain lands are in Hungary, Croatia-Slavonia, Bohemia, Moravia, and Galicia, all of which raise a surplus for export. In all these provinces, except Galicia and in Upper Austria, Styria, Carinthia, and Tyrol, fruit culture is very general. Flax, hemp, and sugar-beets flourish in Bohemia, Moravia, Silesia, and Hungary; hops in Bohemia; tobacco and rape-seed in Hungary. Wine is produced

in all the provinces except Salzburg, Silesia, and Galicia, and especially in Dalmatia and Hungary. In Dalmatia the olive constitutes the main support of the inhabitants. In the Alpine and Carpathian Mountain regions the growth of forests attracts great attention. Nearly a third of the population is employed in agriculture or forestry.

The average annual productions from 1868 to 1875 were as follows: Wheat, including spelt, 94,783,188 bushels; rye, 109,539,852 bushels; barley, 75,769,794 bushels; oats, 122,877,606 bushels; maize, 69,810,372 bushels; buckwheat and millet, 21,851,214 bushels; potatoes, 255,403,800 bushels; beans and peas, 8,513,460 bushels; rape, 207,160,860 bushels; wine, 608,609,400 gallons; timber cut, 7,239,985,000 feet; beet-roots and turnips, 8,820,000 pounds; flax and hemp, 330,661,500 pounds; tobacco, 110,220,500 pounds; hops, 11,022,050 pounds. The Hungarian territory produces three-fourths of the wine. The average annual value of the grain crops during seven years ending with 1875 was \$470,694,000.

Of farm animals the monarchy returned 1,430 horses to each one hundred square miles of area, (the Hungarian territory having 43 per cent. larger proportion than the Austrian territory;) asses, 33; cattle, 5,238; sheep, 8,290; goats, 638; swine, 2,882; bee-hives, 628. The Hungarian territory had 140 horses for each 1,000 of population; the Austrian territory 70; the whole monarchy, 99. Of asses and mules the monarchy had but 2 per 1,000 of the population; of cattle, 356; of sheep, 564, (Hungary having by far the largest proportion;) goats, 3; swine, 196; bee-hives, 43. The annual consumption of meat in the whole country is estimated at 1,323,000,000 pounds; the annual product of milk, at 2,007,752,800 gallons; of butter, fresh and melted, whey and curds, at 3,962,670,000 gallons; cheese, 220,473,700 pounds; of wool, 66,142,110 pounds; average value of annual product of spun silk, \$3,360,000; product of honey, 50,708,951 pounds; bees-wax, 3,307,105 pounds. The average total value of agricultural products of all kinds is estimated at \$1,152,000,000 per annum.

The mineral resources of the monarchy are rich. Gold is found in Hungary and Transylvania, and silver in both these countries and in Bohemia. Iron-ore is mined in all the provinces, especially Styria, Carinthia, Hungary, Bohemia, and Moravia. Carinthia yields quicksilver and lead; western Galicia and Carniola, zinc; the Erzgebirge range in Bohemia, tin; Bohemia and Moravia, graphite; Galicia, sulphur. Coal is mined in large quantities in Bohemia, Moravia, Silesia, Salzburg, and Bukowina. Rock-salt or brine-salt, is produced in nearly all parts of the monarchy. According to the last general census, 154,485 persons were employed in mining, of which 104,342 were in the Austrian territory and 50,143 in the Hungarian. The produce of salt-mining alone is estimated at \$50,000,000 per annum. The largest mining yields were in 1874, embracing 330,000 tons of iron, 2,800 of zinc, 6,700 of lead and litharge, 900 of sulphur, 1,800 of alum, 280,000 of salt, 7,500,000 of all sorts of coal.

The consumption of coal for manufacturing increased from 500,000 tons in 1839 to 8,000,000 in 1875, and the abundant water-power of the country has been brought into extensive use. The manufacturing interest has been most largely developed in Bohemia, Moravia, Silesia, and Lower Austria.

It is estimated that about 8,000,000 persons gain a livelihood, in whole or part, by manufacturing. At the date of the last census, December 31, 1869, there were in the whole empire 298,113 employes in the building trade and productions of art, of which number 235,510 were in the Austrian territory, and the remainder in the Hungarian territory;

677,740 were workers in metal, stone, and wood, 505,772 being in the Austrian provinces; 330,285 in the manufacture of chemicals, articles of food, and tobacco, of which 248,000 were in Austrian provinces; 890,951 in textile manufactures, of which 797,398 were in Austrian territory; 478,704 were engaged in manufactures of leather, paper, &c., 307,794 being in the Austrian dependencies; 244,487 were engaged in occupations outside of industrial production, of which 178,842 were in the Austrian territory. Of the total of the foregoing classes, 2,920,280, about 77 per cent., or 2,273,316, were in the Austrian half of the empire, leaving but 646,964, or 23 per cent., in the Hungarian half.

The empire is girt around with a line of custom-houses for the taxation of foreign imports, but no province lays any impost upon the products of other portions of the half of the monarchy to which it belongs. Either half may levy upon the imported productions of the other a duty no greater than is imposed upon the same articles produced at home. Commercial treaties with foreign states impartially distribute their advantages to both halves of the empire. Standards of money, weights and measures, laws of navigation, sanitary regulations, railway, post, and telegraph laws, &c., are uniform throughout the empire. Citizens of either division are entitled to the immunities of the other. No restrictions are imposed upon the trades, except that foreigners must take out license to work in a few select ones. This license is to secure special qualifications for those trades. The imports of the empire rose from 158,100,000 florins in 1851 to 588,600,000 florins in 1874, and the exports from 136,600,000 florins to 408,200,000 florins. A florin is \$0.4803. Chambers of commerce have been organized in all sections of the empire.

The aggregate length of canals and navigable rivers in 1870 was 6,263 miles; of turnpike and other roads, 61,846 miles. The railway lines have an aggregate length of about 6,000 miles, carrying over 30,000,000 passengers in 1874, of whom only 11 were injured by accidents. The postal system embraces 6,253 post-offices, and the number of letters carried in 1874 was 286,000,000, besides 29,000,000 of postal cards. The money or its substitutes carried during the year amounted to nearly \$21,000,000. The aggregate length of telegraph-line was over 65,000 miles. All other institutions of civilization have broad development.

MARKET-PRICES OF FARM-PRODUCTS FOR JULY 1876.

The following quotations represent, as nearly as practicable, the state of the market at the beginning of the month:

Articles.	Prices.	Articles.	Prices.
NEW YORK.		BOSTON—Continued.	
Flour, superfine, State and western.....per bbl	\$3 40 to \$4 00	Beef, mess.....per bbl	\$10 50 to —
extra State.....do.	4 50 to 5 15	extra mess.....do.	12 00 to —
extra to choice western, per barrel.....do.	4 50 to 8 75	family.....do.	13 00 to \$14 00
southern extra.....per bbl	4 85 to 6 00	Pork, prime.....do.	17 00 to 17 50
southern family.....do.	6 05 to 8 75	mess.....do.	20 00 to 20 50
Wheat, No. 1 spring.....per bush	1 20 to 1 30	Lard.....per lb.	12 to 12½
No. 2 spring.....do.	1 12 to 1 17	Butter, New York and Vermont, per pound.....do.	20 to 25
winter, red, western, per bushel.....do.	85 to 1 45	western.....per lb.	18 to 22
winter, amber, western, per bushel.....do.	93 to 1 45	Cheese, New York and Vermont factory.....per lb.	6 to 10½
winter, white, western, per bushel.....do.	1 25 to 1 45	western factory.....do.	— to —
Corn.....per bush.	56 to 61	Sugar, fair to good refining.....do.	8 to 8½
Oats.....do.	34 to 42	Cotton, ordinary to good ordinary.....per lb.	8½ to 10½
Rye.....do.	80 to 95	low middling to good middling.....per lb.	11½ to 13
Barley.....do.	90 — —	Wool, Ohio and Pennsylvania, per pound.....do.	30 to 43
Hay, baled, first quality, for retail.....per ton	16 00 to 19 00	Michigan.....per lb.	28 to 34
baled, second quality, for shipping.....per ton	13 00 to 14 00	other western.....do.	28 to 34
Beef, mess.....per bbl	10 00 to 11 00	pulled.....do.	15 to 40
extra mess.....do.	12 00 to —	combing fleece.....do.	43 to 46
Pork, mess.....do.	19 75 to 19 85	California.....do.	14 to 27
extra mess.....do.	— to —	PHILADELPHIA.	
prime mess.....do.	19 50 to —	Flour, superfine.....per bbl.	3 25 to 4 00
Lard.....per lb.	11½ to 11½	Pennsylvania extra to choice.....per bbl.	4 25 to 6 50
Butter, western.....do.	16 to 27	western extra to choice, per barrel.....do.	5 00 to 6 50
State dairy.....do.	18 to 23	Wheat, white.....per bush.	1 35 to 1 47
Cheese, State factory.....do.	7 to 11	amber.....do.	1 30 to 1 47
western factory.....do.	6 to 9½	red.....do.	80 to 1 38
Sugar, fair to prime refining, per pound.....do.	8 to 8½	Rye.....do.	75 to 80
Cotton, ordinary to good ordinary.....per lb.	8½ to 10	Barley.....do.	55 to 95
low middling to good middling.....per lb.	11 to 12½	Corn.....do.	54 to 58
Tobacco, lugs.....per lb.	6 to 8	Oats.....do.	28 to 40
leaf.....do.	8 to 10	Hay, baled, prime.....per ton	14 00 to 15 00
Wool, American XXX and picklock.....per lb.	46 to 48	common to fair shipping, per ton.....do.	11 00 to 13 50
American X and XX, per pound.....do.	38 to 44	Beef, western mess.....per bbl.	6 00 to 8 00
American, combing, per lb.	48 to 58	extra mess.....do.	10 50 to 11 00
pulled.....do.	25 to 40	Warthman's city family, per barrel.....do.	14 50 to 15 00
California spring clip, per pound.....do.	19 to 25	Pork, mess.....per bbl.	20 50 to —
California fall clip, per lb.	13 to 16	prime mess.....do.	17 50 to —
BOSTON.		prime, (extra).....do.	17 00 to —
Flour, western superfine, spring, per bbl.....do.	3 00 to 3 50	Lard.....per lb.	11½ to 15
common spring extra, per bbl.....do.	4 25 to 4 75	Butter, choice Middle State.....do.	21 to 26
good to fancy northwestern spring.....per bbl	4 75 to 9 00	choice western.....do.	20 to 22
good to fancy western winters.....per bbl	5 75 to 8 50	Cheese, New York factory.....per lb.	7 to 10½
southern family.....per bbl	6 50 to 8 75	Ohio factory.....do.	4 to 9
Wheat.....per bush	97 to 1 45	Sugar, fair to good refining, per lb.	8 to 8½
Corn.....do.	55 to 63	Cotton, ordinary to good ordinary.....per lb.	8½ to 10
Oats.....do.	30 to 50	low middling to good middling.....per lb.	11½ to 12½
Rye.....do.	90 to 95	Wool, Ohio and Pennsylvania X and XXX.....per lb.	40 to 42
Barley.....do.	— to —	other western.....do.	30 to 36
Hay, eastern and northern, per ton.....do.	16 00 to 21 00	pulled.....do.	22 to 36
		combing.....do.	40 to 55
		tub-washed.....do.	30 to 45
		BALTIMORE.	
		Flour, superfine.....per bbl.	3 00 to 3 75
		extra.....do.	4 00 to 6 50
		family.....do.	7 00 to 8 50

Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	Prices.
BALTIMORE—Continued.		CHICAGO—Continued.	
Wheat, red per bush.	\$1 20 to \$1 30	Rye, No. 2 per bush.	\$0 67 to \$0 67½
amber do.	1 33 to 1 35	Barley, No. 2 do.	56½ to 57
white do.	1 25 to 1 35	Corn, No. 2 do.	46½ to 47
Rye do.	64 to 65	Oats, No. 2 do.	29½ to 30
Oats do.	33 to 45	Hay, timothy per ton.	9 00 to 12 50
Corn do.	50½ to 62	prairie do.	7 00 to 9 50
Hay, Maryland and Pennsylvan- ia per ton	16 00 to 20 00	Beef, mess per bbl	10 75 to 11 00
western do.	14 00 to 15 00	extra mess do.	11 75 to 12 00
Pork, mess per bbl.	21 00 to —	Pork, mess do.	19 50 to 19 60
prime mess do.	21 00 to —	prime mess do.	18 00 to —
extra prime do.	18 50 to —	extra prime do.	14 00 to 14 50
Lard per lb.	12½ to 12½	Lard per lb.	11½ to 11½
Butter, western do.	13 to 20	Butter, choice to fancy do.	18 to 22
eastern, near by receipts, per pound	12 to 16	medium to good do.	14 to 16
Cheese, western factory per lb.	— to —	Cheese, good to choice factory, per pound	8½ to 9½
eastern factory do.	— to —	Sugar, New Orleans per lb.	— to —
Sugar, fair to good refining do.	8½ to 8½	Wool, tub-washed do.	30 to 38
New Orleans, grocery grades per lb.	— to —	fleece-washed do.	25 to 28
Tobacco, lugs do.	6½ to 11	unwashed do.	17 to 21
leaf, common to medium, per pound	9 to 11	pulled do.	— to —
Cotton, ordinary to good ordi- nary per lb.	8½ to 9½	SAINT LOUIS.	
low middling to good middling per lb.	10½ to 11½	Flour, winter, common to choice, per bbl.	3 50 to 6 50
CINCINNATI.		spring per bbl.	— to —
Flour, superfine per bbl	3 40 to 3 75	Wheat, white winter per bush.	1 12 to 1 15
extra do.	4 25 to 4 65	red winter do.	86 to 1 30
family do.	5 00 to 7 50	spring do.	— to —
Wheat, winter, red per bush.	1 00 to 1 20	Corn do.	39 to 45
hill, (amber) do.	1 20 to 1 30	Rye do.	50 to 63
white do.	1 20 to 1 30	Barley, fair to choice do.	30 to 1 00
Oats do.	22 to 42	Oats do.	31 to 35
Corn do.	48 to 51	Hay, timothy per ton.	15 00 to 16 00
Rye do.	60 to 75	prairie do.	8 00 to 9 50
Barley do.	80 to 85	Beef, mess per bbl.	14 00 to 14 50
Hay, baled, No. 1 per ton	13 00 to 16 00	Pork, mess do.	19 00 to 20 50
lower grades do.	5 00 to 10 00	Lard per lb.	11½ to 12½
Pork, mess per bbl.	19 50 to 20 00	Butter, prime to choice dairy, per pound	14 to 18
Lard per lb.	11 to 13½	country packed per lb.	13 to 16
Butter, choice do.	17 to 18	Cheese, Ohio factory do.	12½ to 13½
prime do.	15 to 17	N. Y. factory do.	13 to 14
Cheese, prime to choice factory, per pound	8 to 9	Wool, tub-washed do.	36 to 37½
Sugar, New Orleans, fair to good, per pound	8½ to 9	fleece-washed do.	34 to 35
prime per lb.	9 to 9½	unwashed do.	27 to 30
Tobacco, lugs do.	— to —	NEW ORLEANS.	
leaf do.	— to —	Flour, superfine per bbl.	4 00 to —
Cotton, ordinary to good ordi- nary per lb.	8 to 9½	extra do.	4 25 to 5 50
low middling to good middling per lb.	10½ to 12	choice to fancy do.	5 75 to 7 50
Wool, fleece-washed, common to fine per lb.	26 to 28	Corn, white and yellow per bush	62 to 68
tub-washed do.	25 to 34	Oats do.	35 to 42
unwashed, clothing do.	20 to 22	Hay, choice per ton	22 00 to 23 00
unwashed, combing do.	25 to 30	prime do.	17 00 to 19 00
pulled do.	23 to 25	Beef, Texas per bbl.	10 00 to 11 00
CHICAGO.		western do.	13 00 to 14 50
Flour, choice winter extras, per barrel	7 25 to 7 75	Fulton market per ½ bbl.	11 75 to 12 00
common to good winter extras per bbl.	5 75 to 7 12½	Pork, mess per bbl.	21 50 to —
spring extras, common to good per bbl.	4 50 to 5 37½	Lard per lb.	11½ to 13½
spring extras, choice do.	5 50 to 5 75	Butter, choice Goshen do.	32 to —
patent spring do.	6 00 to 9 00	choice western do.	23 to 25
spring superfines do.	3 00 to 4 00	Cheese, choice western factory, per pound	9 to 11
Wheat, No. 1 spring per bush.	1 11 to —	N. Y. cream per lb.	14½ to —
No. 2 spring do.	1 03½ to 1 04½	Sugar, fair to fully fair do.	8 to 8½
No. 3 spring do.	88 to 88½	prime to strictly prime, per pound	9 to 9½
		clarified, white, and yel- low per lb.	9½ to 10½
		Cotton, ordinary to good ordi- nary per lb.	6½ to 8½
		low middling to good mid- dling per lb.	10½ to 12½
		Tobacco, lugs do.	5½ to 7½
		leaf, low to medium, per pound	8 to 11½

Market-prices of farm-products, &c.—Continued.

Articles.	Prices.	Articles.	Prices.
SAN FRANCISCO.		SAN FRANCISCO—Continued.	
Flour, superfine.....per bbl.	\$4 00 to \$4 75	Beef, mess.....per bbl.	\$8 50 to \$10 00
extra.....do....	5 00 to —	family mess.....per $\frac{1}{2}$ bbl.	7 50 to 10 00
family and fancy.....do....	5 25 to 5 75	Lard.....per lb.	13 to 15
Wheat, California....per cental.	1 40 to 1 65	Butter, overland.....do....	16 to 18
Oregon.....do....	1 60 to 1 65	California.....do....	25 to 28
Barley.....do....	80 to 1 15	Oregon.....do....	20 to 22 $\frac{1}{2}$
Oats.....do....	1 75 to 2 25	Cheese.....do....	12 $\frac{1}{2}$ to 15
Corn.....do....	1 05 to 1 15	Wool, native.....do....	8 to 10
Hay, State.....per ton.	7 00 to 13 00	California.....do....	15 to 19
Pork, mess.....per bbl.	22 00 to 24 00	Oregon.....do....	15 to 19
prime mess.....do....	17 50 to 18 50		

LIVE-STOCK MARKETS.

NEW YORK.		CHICAGO—Continued.	
Cattle, extra beeves.....per cental.	\$10 25 to —	Cattle, medium.....per cental.	\$4 00 to \$4 25
good to prime.....do....	10 00 to \$10 25	inferior natives.....do....	2 00 to 3 75
common to fair.....do....	— to 9 00	Texas.....do....	2 50 to 4 00
Texans.....do....	— to —	Sheep.....do....	3 25 to 4 65
milk-cows.....per head.	— to —	Swine.....do....	6 00 to 6 40
veal calves.....per cental.	— to —		
Sheep.....do....	4 75 to 5 75	SAINT LOUIS.	
Swine.....do....	— to —	Cattle, good to choice native	
PHILADELPHIA.		steers, per cental.....	4 60 to 4 75
Cattle, prime beeves.....per cental.	6 00 to 6 75	common to fair natives,	
fair to good.....do....	5 25 to 5 75	per cental.....	3 25 to 4 25
common.....do....	4 25 to 5 00	inferior to common na-	
Sheep.....do....	1 50 to 5 75	tives.....per cental.	2 00 to 3 25
Swine, corn-fed.....do....	8 75 to 9 25	Texans, fair to choice,	
BALTIMORE.		per cental.....	3 00 to 4 00
Cattle, best beeves.....per cental.	4 87 to 5 87	Sheep.....per cental.	3 75 to 5 25
first quality.....do....	4 12 to 4 87	Swine.....do....	5 50 to 5 75
medium or good quality,		Horses, plugs.....per head.	30 00 to 35 00
per cental.....	3 75 to 4 12	plain.....do....	45 00 to 55 00
ordinary.....per cental.	3 50 to 3 75	street-car.....do....	75 00 to 125 00
general average of the		heavy-draught.....do....	115 00 to 125 00
market.....per cental.	5 12	good drivers.....do....	175 00 to 225 00
most of the sales.....do....	4 62 to 5 50	extra.....do....	225 00 to 250 00
milk-cows.....per head.	— to —	auction, and ponies, per	
Sheep.....per cental.	2 00 to 5 00	head.....	25 00 to 45 00
Swine.....do....	8 75 to 9 25	Mules, 14 to 15 hands high.....do....	85 00 to 120 00
CINCINNATI.		15 to 16 hands high.....do....	115 00 to 150 00
Cattle, good to prime butchers'		extra.....do....	175 00 to 185 00
steers.....per cental.	4 25 to 4 75	NEW ORLEANS.	
fair to medium.....do....	3 25 to 4 25	Cattle, Texas beeves, choice, per	
common.....do....	2 25 to 3 00	head.....	— to 40 00
milk-cows.....per head.	— to —	first quality.....per head.	— to 35 00
veal calves.....per cental.	— to —	second quality.....do....	— to 30 00
Sheep.....do....	3 00 to 4 50	western beeves, per cental.	4 00 to 5 50
Swine.....do....	5 90 to 6 25	milk-cows.....per head.	40 00 to 90 00
CHICAGO.		veal calves.....do....	7 00 to 9 00
Cattle, extra-graded steers, per		Sheep.....do....	2 00 to 6 00
cental.....	— to —	Swine.....per cental.	6 00 to 8 50
choice beeves.....per cental.	4 70 to 4 90	Horses, good condition, per head	
good beeves.....do....	4 35 to 4 60	plugs.....do....	Horse and mule market closed for the season.
		common.....do....	
		Mules, well-broken, first-class,	
		per head.....do....	
		second-class.....per head.	

FOREIGN MARKETS.

WHEAT.—The latter part of May and the first half of June in the United Kingdom were marked by alternate sunshine and shower, which told very favorably upon the prospects of growing crops. The cold, backward spring has not injured the grain crops to anything like the extent that was anticipated, and vegetation generally appears to be vigorous and healthy. Warm rains about the close of the first week of June were quite general throughout the British Isles. Yet, even with the immense improvement in the conditions of growth, the more sanguine scarcely dare hope that the lost lee-way of the cold, backward spring will be recovered, though the wheat covers the ground very thickly and seems to be growing finely. French crops present the same favorable auguries, with a still greater probability from the fact that the continental climate is less subject to extremes than the insular one of England. The temporary settlement of the difficulties growing out of the eastern question, and the growing hope of a final pacification in the Turkish peninsula has dispelled much of the anxiety which gave a specially painful interest to the crop prospects. These cheering indications, agricultural and political, have quieted the tone of the markets, especially as the large supplies arriving daily from America and Russia gave present and substantial tokens of a sufficient supply of breadstuffs. The indications of growing conditions up to the very time of harvest will doubtless more or less affect prices, but there are no indications that the prices of wheat will be very greatly disturbed during the intervening period. In Germany the improvement has been especially marked, and the appearance of wheat-fields is very encouraging. Timely rains have fallen in the low countries, giving a quietus to the speculative uneasiness that had begun to show itself. In Austria, the fine weather had given a downward tendency to prices. In Algeria, the harvest had been secured in good order, and cereal crops were reported as quite satisfactory. In Egypt, the market for wheat was dull and declining for all except the better sorts. Fine rains in Australia had set the farmers to plowing, and hence the marketing of wheat was less rapid than previously.

The sales of English wheat during the week closing June 17 amounted to 40,330 quarters, at 47*s.* 4*d.* per quarter, against 37,634 quarters, at 41*s.* 11*d.* during the corresponding week of 1875. The London averages were 49*s.* 1*d.* on 1,992 quarters. The imports during the week ending June 10 were 1,004,682 cwt.

The market opened in London, Monday, June 12, with considerable firmness, notwithstanding the fine weather and the large arrivals of foreign wheat, amounting to 40,080 quarters, mostly Russian. Essex and Kent, white, brought from 45*s.* to 52*s.* per quarter; ditto, red, 40*s.* to 48*s.*; Norfolk, Lincolnshire, and Yorkshire, 40*s.* to 46*s.*; Dantzic, mixed, 52*s.* to 55*s.*; Königsberg, 50*s.* to 54*s.*; Rostock, 50*s.* to 53*s.*; Pomeranian, Mecklenberg, and Uckermark, red, 48*s.* to 51*s.*; Ghirka, 44*s.* to 45*s.*; Russian, hard, 45*s.* to 46*s.*; Saxonska, 46*s.* to 47*s.*; Danish and Holstein, red, 46*s.* to 49*s.*; American, red, 44*s.* to 54*s.*; Chilian, white, 49*s.*; Californian, 51*s.*; Australian, 52*s.* to 55*s.*

At Liverpool British white wheat (June 16) was quoted at 9*s.* 8*d.* to 10*s.* 4*d.* per cental; ditto, red, 9*s.* 4*d.* to 10*s.*; Canadian white, 9*s.* 8*d.* to 10*s.* 1*d.*; ditto, red club and golden drop, 9*s.* 4*d.* to 10*s.*; American, red winter, 9*s.* 10*d.* to 10*s.* 8*d.*; No. 1 Minnesota, 9*s.* 8*d.* to 10*s.*; No. 1 spring,

9s. 6d. to 10s.; No. 2 spring, 8s. 11d. to 9s. 8d.; Indian, 8s. 6d. to 10s.; Egyptian, 7s. to 8s. 9d.; California, 9s. 10d. to 10s. 2d.; ditto, club, 10s. 3d. to 10s. 6d.; Oregon, 10s. 3d. to 10s. 6d.; Chilian, 9s. 6d. to 9s. 9d.; Australian, 10s. 7d. to 10s. 10d.

In France, 11 markets advanced during the week ending June 17 against 6 the previous week; 54 remained stationary against 44 the previous week; 37 declined, or 10 less than the previous week. Prices of wheat, on the whole, ranged from 51s. to 51s. 6d. per quarter, with increasing rates for future deliveries. At Hamburg millers have been buying only enough to meet present necessities, and hence, with a fresh demand setting in, have no stock to fall back upon, but must swell that demand by extensive purchases. The best yellow Rostcok brought 53s. 6d. to 55s. per quarter.

FLOUR.—The imports during the week ending June 10 were 76,070 cwt. against 104,254 cwt. the previous week. The demand had improved and higher prices had been obtained in some instances. In Mark Lane the best town households were quoted at 37s. to 43s. per 280 pounds; best country households, 35s. to 37s.; Norfolk and Suffolk, old, 30s. to 32s.; French, 30s. to 35s.; American, per barrel, 24s. to 27s. At Liverpool, English and Irish superfines brought 36s. to 38s. per 280 pounds; extra, ditto, 39s. to 41s.; French, 39s. to 41s. 6d.; Trieste, 50s. to 57s.; Chilian, 34s. to 35s.; Californian, 36s. to 38s. 6d.; American, western and extra state, 22s. to 25s. per barrel of 196 pounds; Baltimore and Philadelphia, 22s. to 26s.; Ohio and extra, 23s. to 26s.; Canadian, 23s. to 27s.; patent, 30s. to 34s. At Paris select marks flour brought 41s. 3d. to 41s. 10d. per 280 pounds.

MAIZE.—In Mark Lane white was quoted at 29s. to 30s. per quarter; ditto, yellow, 27s. to 28s. At Liverpool, American white, 27s. to 27s. 3d.; American, mixed, 26s. 6d.; Galatz, 27s. 6d. to 28s.; Danubian, 25s. 9d. to 26s. 3d.; Dari, 23s. to 24s.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

AUGUST AND SEPTEMBER, 1876.



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1876.

MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
STATISTICAL DIVISION,
Washington, D. C., September 25, 1876.

SIR: I respectfully present for publication a digest of the crop-returns of August and September, and other current statistics, domestic and foreign, relating to production and distribution, markets and prices.

Respectfully,

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

DIGEST OF THE CROP-RETURNS. I

CORN.

Our August returns indicated that the crop of the country was full average, the deficiency in the great corn-producing States of the Northwest being compensated by the superior condition of the other sections. During August, however, great local changes took place, but the improvement in some sections was more than counterbalanced by the decline in others, resulting in a net loss in condition of 2 per cent., and reducing the general condition of the crop to about 98. All the New England and Middle States fell off except Rhode Island and New Jersey. In these States drought in July greatly reduced the crop, but the refreshing rains of August partly repaired the damage. In the other States of these sections the conditions were reversed. The fine growth attained in July was considerably cut down by the drought of August. Insect-injuries and premature frosts also affected the crop in some of the more northern counties. All of the South Atlantic States show an advance, and a condition, on the whole, considerably above average. During July the condition of the crop in this section was depressed in some counties by drought and in others by abnormally-low temperature and cool nights, while in a few cases grub-worms and grasshoppers injured the growing plants. In August, however, improved conditions of growth were very general, though some local disasters are reported. Chinchcs and grasshoppers were troublesome in some counties, and occasional freshets injured bottom-crops in others, but the improvement on the whole was marked and satisfactory.

On the other hand, the Gulf States all declined, except Louisiana, which shows a very considerable advance upon the low condition of August. Alabama and Texas are still above average, but do not attain the high figures previously reported. Florida and Mississippi show a slight decline. Drought in some counties and excessive rain in others reduced the condition of the crop, but there are numerous congratulations from our correspondents in the Gulf States on having raised the best crop since the war. A larger number of counties than ever before report a production fully equal to the home demand, with a marked reduction of local prices. An increased acreage gives greater effect to improved conditions, and the people are encouraged with the hope that this region will soon raise all the corn needed for home consumption. A few unimportant insect-depredations are noted.

All of the Southern inland States are above average, and all have improved during August. Local droughts or flooding rains are reported and, in a few counties, injuries from bud-worms, wire-worms, and chinchies. One or two of our correspondents justly criticise the slovenly systems of culture followed by many of their neighbors. The general indications point to an abundant yield and low prices. In Washington, Arkansas, corn was selling at $7\frac{1}{2}$ and 8 cents per bushel on the stalk.

North of the Ohio River all the States report an improved condition at end of August except Michigan. Ohio and Wisconsin are above average, while the great corn-regions of Indiana and Illinois show a gratifying improvement, greatly reducing the decline apprehended at the close of July. During that month drought and excessive rains had prevailed over alternate zones of the corn-region, the former partially paralyzing vegetation and the latter preventing cultivation and causing the fields to be overrun with weeds. Where drought prevailed, bottom-crops were the best, but with excessive rains, rolling uplands had the advantage. Insect depredations were on a smaller scale than usual; those old enemies of the farmer, the chinchies, appeared in a few counties, but too late to do serious injury to the corn-crop. East of Lake Michigan heavy rains were the common topic of complaint, and it was noticed in several counties that sandy rolling lands produced the best crops. Frost also injured some lowland crops, and in one or two cases extreme heat and drought are alleged as causes of decline. West of Lake Michigan the feeling of our correspondents is more jubilant over a fine promise of the crop, the average condition of Wisconsin being 11 per cent. above average, an improvement of 10 per cent. during August.

Between the Mississippi and Missouri Rivers, Minnesota maintains her August average in spite of the ravages of grasshoppers in her western counties, while Iowa and Missouri report an improved condition. West of the Missouri, Kansas advanced to 6 per cent. above average. The grasshoppers came too late to do much injury in this State, but in Nebraska they reduced the very superior condition at the close of July to one below average at the close of August.

On the Pacific coast the condition of the crop improved at least 5 per cent. during August. Frost and low temperatures injured the plants in some counties.

MAINE.—*Piscataquis*: Severe drought, but corn is too far advanced to be injured by it. *York*: Ripening prematurely on account of the drought. *Franklin*: Late plantings injured by drought. *Waldo*: Never better. *Cumberland*: Injured by drought.

NEW HAMPSHIRE.—*Cheshire*: Too dry for corn. *Carroll*: Upland crops injured by drought.

VERMONT.—*Franklin*: Injured on sandy soils by drought; prematurely ripened. *Grand Isle*: Injured by drought. *Rutland*: Suffered from drought. *Windsor*: Drought. *Orleans*: Well-ripened and fine.

MASSACHUSETTS.—*Hampshire*: A great deal of smut in corn. *Hampden*: Shortened by drought. *Plymouth*: Looks well, but not quite average.

CONNECTICUT.—*New London*: Good, but injured by drought on dry soils.

NEW YORK.—*Warren*: Drought. *Greene*: Prematurely ripened by drought. *Washington*: Injured by drought. *Schoharie*: Shortened by drought. *Montgomery*: Ruined by drought. *Saratoga*: Very irregular; some fields with fair crops, while fields alongside are without an ear. *Chautauqua*: Severe August drought; crop seriously injured. *Genesee*: Later plantings shortened by drought. *Onondaga*: Destructive drought, especially on sandy soils. *Steuben*: Drought. *Wyoming*: Matured early; shortened by drought. *Orange*: Much injured by drought. *Niagara*: Destructive drought and heat. *Madison*: Half crop; severe drought. *Livingston*: Fine crops in some localities and very poor in others. *Franklin*: Excessive drought. *Dutchess*: Much injured by drought. *Yates*: Well grown and well eared, but much of it is smutted. *Sullivan*: Shortened by severe drought. *Broome*: Affected by drought. *Erie*: Well ripened.

NEW JERSEY.—*Sussex*: Shortened by drought. *Salem*: Best prospect for twenty years. *Mercer*: Suffered severely by drought. *Burlington*: Drought severe. *Cumberland*: Good in some sections favored with seasonable rains. *Warren*: Improved, but many fields smutted.

PENNSYLVANIA.—*Chester*: Very fine. *Lancaster*: Very large crop. *Elk*: Crop good and safe. *Bedford*: Maturing well; weather dry and warm with occasional rain. *Beaver*: Early ripening. *Tioga*: Shortened by drought. *Armstrong*: Suffered severely from drought; ripened prematurely. *York*: Promising. *Monroe*: Suffered from drought. *McKean*: Suffered from worms and drought. *Cameron*: Greatly injured by drought. *Butler*: Much soft corn from late planting. *Clearfield*: Light. *Westmoreland*: Large crop in spite of grasshoppers, provided frost holds off. *Northampton*: No rain for six weeks; very short. *Warren*: Greatly injured by drought, and some late plantings by frost on lowlands, August 20. *Washington*: Drought caught corn in the milk and shortened it. *Sullivan*: Brought on rapidly by warm weather in August. *Lekigh*: Suffering from drought. *Berks*: Shortened by drought. *Lycoming*: Shortened by drought in July and August. *Wyoming*: Dried up.

DELAWARE.—*Sussex*: Extreme drought parching fodder.

MARYLAND.—*Prince George*: Above average. *Howard*: Dry weather at earing, but good crop. *Calvert*: Crop unequal; some fields excellent, having had abundant rain; others shortened by drought. *Baltimore*: Heavy yield; well worked. *Queen Anne*: Ground well prepared, but a protracted drought in July greatly reduced the yield; matured two or three weeks earlier than usual. *Wicomico*: Greatly improved by August rains; prospect better than for ten years. *Carroll*: Never better. *Frederick*: Best prospect for years.

VIRGINIA.—*Pulaski*: Best for several years, though injured by drought on some uplands. *Smythe*: Prospect somewhat less flattering but large yield promised. *Orange*: Greatly shortened by drought, lasting to July 28, but greatly improved by subsequent rains. *Elizabeth City*: Holds its own in spite of the heat and drought of August. *Carroll*: Never better. *Buchanan*: Excellent. *Russell*: Fair to good condition. *Prince William*: Improved by the favorable season. *Mecklenburgh*: Improved by late rains. *Fluvanna*: Early plantings injured by drought. *Rockingham*: Fine crop, but injured by drought in lower parts of the county. *Madison*: Good in upper portions of county; rains partial. *King George*: Best crop for many years. *James City*: Warm copious rains of July and August have more than compensated the drought of June. *Dinwiddie*: Well cultivated and full average. *Middlesex*: Shortened by drought in June 20 per cent. *Campbell*: Improved by late rains; looks well where well cultivated. *Bland*: Injured in some localities by drought at sowing-time. *Sussex*: Very fine prospect. *Loudoun*: Crop made and remarkably fine. *Wythe*: Best crop for years. *Northampton*: Best crop for many years. *Princess Anne*: Crop saved by August rains; all except late plantings matured. *Highland*: Saved by the August rains. *Westmoreland*: A good crop.

NORTH CAROLINA.—*Wilson*: Improved during August; late plantings doing well. *Onslow*: Fair. *Union*: Best since the war. *Transylvania*: Greatly improved, especially late plantings. *Stokes*: Late rains partly compensated the previous drought. *Orange*: Greatly improved by the copious rains of August. *Greene*: Shortened 10 per cent. by drought in July and August. *Chowan*: Yield light. *Alamance*: Greatly improved in August, though early plantings were greatly injured by drought. *Iredell*: Greatly improved by August rains. *Nash*: Doing well in spite of local drought. *Davidson*: Bottom-crops destroyed by spring floods. *Warren*: Brought up to average by fine rains; chieues abundant in some localities; strong lye of wood-ashes applied to the stalk effectually destroyed them; care should be taken not to apply the lye to the bud of the corn, as it will kill it. *Mecklenburgh*: Good on uplands; too much rain on bottoms. *Wilkes*: Late fine weather has brought the crop to an average condition. *Perquimans*: Generally good. *Gaston*: Not fully recovered from July freshet. *Edgecombe*: Doing well, especially late corn; fine rains lately. *Buncombe*: Short—bad stand in spring and drought afterward. *Carteret*: Fair prospects. *Polk*: Damaged by spring

freshets; if that replanted matures, there will be two-thirds of a crop. *Caldwell*: Injured by Jun. freshets. *Hertford*: Greatly injured by extensive rains in July and August. *Madison*: Improved beyond expectation by the rains of August.

SOUTH CAROLINA.—*Newberry*: Over average and well matured. *Clarendon*: Several heavy showers came just in time to make the crop. *Spartanburgh*: Variable; low lands submerged and their crops short and late. *Chesterfield*: Late plantings need rain badly. *Lexington*: Crop average; late plantings suffering from drought. *Union*: Upland crops above average, while on bottoms they are below average; freshets.

GEORGIA.—*Twiggs*: Good. *Jefferson*: Unusually good. *Dade*: Abundant home-supply and some old corn left over. *Upson*: As good as the land will bring. *Whitfield*: Injured by drought. *Lumpkin*: Late rains have about made the crop. *Jackson*: Splendid crop made. *Floyd*: Injured by drought and grasshoppers, especially late plantings. *Clayton*: Best crop since the war, though some bottom-lands do not bring half a crop. *Baldwin*: Crop made, and a very fine one. *Walton*: The favorable report of July repeated; seasonable weather throughout August. *Richmond*: Crop first-rate on the whole. *Oglethorpe*: Late corn the best for ten years; much planted late on account of overflows in the spring. *McDuffie*: Best crop in ten years. *Fulton*: Early plantings very fine; late, injured 25 per cent. by drought. *Dooley*: Finest crop in ten years. *Marion*: Best crop in ten years. *Baker*: Crop made; ample for home consumption; over half the plantings will make a good crop. *Thomas*: Best crop ever made here. *Fannin*: Crop made, and excellent. *Troup*: Ears large but light. *Towns*: Too much rain in the early part of the season. *Pulaski*: Badly injured by drought in at least a third of the county. *Elbert*: Fine season. *Barton*: Injured by drought and grasshoppers. *Lincoln*: Good on uplands, but injured by freshets on bottoms. *Taylor*: Crop made; the best ever raised here; a surplus to spare. *Wilcox*: Very fine. *Polk*: Best crop since the war.

FLORIDA.—*Suwanee*: Did not fill well. *Jackson*: Increased aggregate yield. *Hillsborough*: Housed in good order. *Columbia*: Injured by drought. *Gadsden*: Fodder saved in good condition.

ALABAMA.—*Etowah*: Ample for home consumption. *Limestone*: Rain at planting caused a bad stand in corn. *De Kalb*: Late planting damaged by drought, but the crop will be ample for home consumption; generally fine on upland soils. *Crenshaw*: Above average. *Clarke*: Good. *Calhoun*: Fully matured, and about as good as the land can bring without fertilizers. *Concord*: Good crop. *Franklin*: Two months' rain benefited the crop. *Coffee*: Best crop since the war. *Clay*: Has done well; too little of it grown to meet the home demand. *Russell*: Abundant for home consumption. *Monroe*: Rotted unusually from excessive rains. *Bullock*: Fine crop. *Saint Clair*: Abundant; old corn sells at 50 cents per bushel. *Greene*: Very short. *Chambers*: Fine growing season. *Blount*: Better than last year, but much of it is late and not yet matured. *Lauderdale*: Damaged by excessive rains. *Colbert*: Crop large.

MISSISSIPPI.—*Rankin*: Well matured; good in some parts, but a failure in others. *Lee*: Injured by excessive rains; blown down and rotting in some places. *Kemper*: Not near so good as last year; probably enough for home consumption. *Tishomingo*: Crop abundant; more than sufficient for home demand. *Perry*: Early planting stunted by spring droughts, yet the general yield will be 25 per cent. above average. *De Soto*: A beautiful crop made. *Choctaw*: Injured by excessive rains, especially late plantings on bottom-lands. *Corvinton*: Injured by drought; rains too late to repair the damage. *Winston*: The late rains have been excellent for the crop, except on low bottoms. *Jasper*: Injured by drought; plenty of old corn for 50 cents per bushel; a fact unprecedented at this time of year. *Yalabusha*: Injured by excessive rains. *Wayne*: Good crop, and safe. *Grenada*: Injured by storms and wet weather. *Greene*: Good. *Anite*: Acreage increased. *Lauderdale*: Above average, and equal to the best crop for the last ten years. *Jefferson*: Poor; late plantings best.

LOUISIANA.—*Franklin*: Rains too late; crops three-fourths average, scant. *Morehouse*: Two-thirds of a crop; drought. *Washington*: Lack of rain in places shortened the crop. *Iberia*: Unusually fine. Previous to last year the home product commanded \$1 to \$2 per barrel; it then fell to 50 and 60 cents; the new crop is now offered for 40 cents. *Richland*: Early corn on high lands suffered from drought; on bottoms from overflow in the spring, and, after replanting, from insects. *East Feliciana*: Shortened by drought in June and July; subsequently by the army worm. *East Baton Rouge*: Recent rains beneficial, especially to late plantings. *Jackson*: Best crop in ten years, but much fodder lost by late rains.

TEXAS.—*Smith*: Unusually heavy and well filled out. *Marion*: Crop excellent. *Dallas*: Best crop in ten years. *Cooke*: Very fine. *Burnet*: Late corn badly worm-eaten. *Williamson*: Largest crop ever raised. *Waller*: A vast difference; early plantings heavy and full; late plantings the reverse. *Collin*: Very heavy. *Washington*: Selling at 30 and 40 cents per bushel. *Red River*: Fully made, fine and abundant. *Kaufman*: Excellent; offered at 25 cents per bushel in the field. *Austin*: Damaged to some extent by spring drought. *Upshur*: Sound and well matured. *Panola*: Well matured; finest crop we ever raised. *Kendall*: Yield double that of any year of the last

ten. *Titus*: Crop safe, large, and of good quality. *Harrison*: Best crop in ten years. *Grayson*: Never better; surplus over home consumption. *Coryell*: Above average. *Bandera*: Fine crop fully made. *Bee*: Largest crop ever made here. *Hunt*: Largest crop ever made in the county; Pennsylvania yellow corn ahead of all others.

ARKANSAS.—*Clay*: Late corn injured by the prevailing drought. *Saint Francis*: Best crop for several years. *Prairie*: Best crop for years; will not bring over 25 cents per bushel. *Jefferson*: Heaviest crop since the war. *Franklin*: Unusually good; season favorable for tillage. *Washington*: Selling at $7\frac{1}{2}$ and 8 cents in the field; large stock of old corn on hand; new crop above average. *Sevier*: Never better; ample for home demand. *Monroe*: Crop made; abundant. *Arkansas*: Looks fine; plenty of rain in August. *Lonoke*: Largest crop ever made in the county. *Pulaski*: Never better; much old corn on hand. *Benton*: Late plantings ruined by drought. *Bradley*: Enough made for home use. *Fulton*: Increased acreage; excellent yield.

TENNESSEE.—*Wilson*: Unusually fine. *Rhea*: Filling well. *McMinn*: Good, in spite of drought in July and August. *Hardeman*: Above average; about equal to last year. *Greene*: Heavy crop. *Gibson*: Prospect of a better crop than usual. *Blount*: Injured by drought in some localities, but a fair average on the whole. *Union*: Cut short by drought. *Trousdale*: Very fine. *Davidson*: Reduced to average by severe windstorms. *Cannon*: Too much rain. *Tipton*: Very good where properly cultivated. *Smith*: Weather very favorable; crop matured. *Fentress*: Unusually fine. *Monroe*: Cut short. *Maury*: Very fine. *Perry*: Largest yield ever realized is confidently expected. *Shelby*: Splendid harvesting season. *Sequatchie*: Average, but not so good as last year. *Grundy*: Below last year in condition. *Putnam*: Never better.

WEST VIRGINIA.—*Preston*: Average greater than for fifteen years. *Raleigh*: Very fine. *Braxton*: Best crop for several years. *Hardy*: At least 10 per cent. above average. *Mercer*: Recent rains have improved the crop. *Monroe*: Heavy, except on poor, stony land. *Wetzel*: Greatly benefited by recent fine weather. *Jefferson*: Ripening finely.

KENTUCKY.—*Cumberland*: Best crop for many years. *Shelby*: Heaviest yield in ten years. *Nicholas*: About average. *Dariess*: Crop bids fair to yield 1,200,000 bushels. *Madison*: Largest crop ever raised here. *Caloway*: Very fine. *Carroll*: Unusually fine season for corn. *Henry*: Unusually heavy crop in some sections, but poor in others. *Lincoln*: Promises a heavy crop of fine quality. *Logan*: Fine season. *Mason*: Not so heavy as last year, but good; matured early. *Spencer*: Crop luxuriant but kept green by rains, and in danger of early frosts. *Owsley*: Cut down 50 per cent. by drought. *Metcalf*: Best crop ever raised here.

OHIO.—*Ashtabula*: Full average, in spite of local injuries. *Clark*: Full crops. *Washington*: Planting retarded by the wet weather in spring; the crop will require a late fall. *Williams*: Injured by wet weather succeeded by drought. *Preble*: August not favorable to the crop. *Franklin*: Remarkably favorable season. *Wayne*: Fine crop; ripening well. *Hamilton*: Uplands below average; bottoms above. *Perry*: Excellent, except a few pieces injured by drought; less damage from floods than for many years. *Athens*: Short in some localities; saved poorly; drought. *Delaware*: Increased average and good yield. *Geauga*: Best crop for years. *Harrison*: Promises to be one of the best crops ever raised in the county. *Sandusky*: Injured by wet weather. *Henry*: A fourth of a crop; continued rains prevented cultivation; overrun with weeds; this failure for the third year has awakened attention to the necessity of underdraining. *Huron*: Looks well, but is late. *Lucas*: Greatest crop of weeds ever raised; corn, where it could be cultivated, is doing well; underdraining suggesting itself. *Muskingum*: Early plantings above average; late plantings shortened by drought. *Noble*: Too wet. *Portage*: Rains and hot weather have made large crops which promise an early maturity. *Wood*: Excessive rains have caused the lowland and prairie crops almost entirely to fail; over 20,000 acres will not yield a bushel of good corn to the acre. *Lorain*: Very early.

MICHIGAN.—*Kalamazoo*: Corn-fodder parched with drought. *Lapeer*: Looks remarkably well. *Tuscola*: Injured seriously by early frost; upland crops escaped. *Ottawa*: Not well filled. *Wayne*: Never better. *Calhoun*: Injured by heavy rains. *Mecosta*: On sandy land never better; on heavy land it suffered from excessive rains in the fore part of the season. *Muskegon*: Excellent on lands dry enough to be cultivated in June, but a great breadth was drowned out or overgrown with weeds. *Oakland*: Shortened by heat and drought in August. *Mason*: Promising.

INDIANA.—*Clarke*: Fine crop. *Decatur*: Injured by excessive rain preventing cultivation. *De Kalb*: Very poor on wet flat land, but good on sandy soil. *Franklin*: Doing well; weather very favorable. *Laurence*: Fine weather for corn; full crop, in spite of wire-worms. *Pike*: Largest crop yet raised in the county. *Ripley*: Fine crop; if frost delays till September 20, the yield will be above average. *Shelby*: Greatly improved by recent rains. *Warren*: Improved 20 per cent. during August. *Washington*: Injured in some localities by drought in the earlier part of the season, but is good on bottoms, though somewhat damaged by recent storms. *Wabash*: Full crop on bottoms, but damaged on uplands. *Brown*: Good; ripening finely. *Stark*: Shortened by wet

weather in the early part of the season, but greatly improved of late. *Jasper*: Badly drowned out or overrun with water-grass, which is cured for hay; out of danger from frost. *Marion*: Very good where well tended; ripening retarded by excessive rains, which have interfered with cultivation on all ground not naturally dry or well under-drained. *Marshall*: Crop lighter than last year's; out of the way of frost.

ILLINOIS.—*Bureau*: Too wet for corn up to August 10; since then too dry; crop damaged considerably. *Hardin*: A splendid crop blown down by storms. *Ford*: A third of a crop if frost holds off. *Carroll*: Area, 75,000 acres, or 2,000 more than last year; August all that could be desired for ripening; early plantings already ripe. *Clinton*: Uplands very fine; lowlands inferior. *De Kalb*: Fine weather for ripening; approximate average. *Efingham*: Damaged by wet in June and July; not over half a crop; kernel good. *Fayette*: Full average. *Franklin*: Injured by drought for several weeks. *Jefferson*: Fine, especially on high lands. *Madison*: Heavy on dry lands; poor on low undrained fields. *Marshall*: Excellent on rolling and well-drained land, but poorly cultivated on account of excessive rain in June and July. *Mercer*: Crops excellent in quality and abundant on well-drained land. *Scott*: Injured by a drought of five weeks. *Shelby*: Some crops totally failed on account of excessive rain. *Winnebago*: Safe from frost, and good. *Woodford*: Thousands of acres will not average a peck per acre; ruined by extremely wet season. *Clark*: Excessive rain in June and July drowned out many crops and caused an immense growth of weeds. *Hamilton*: Suffered from wet on level land, but lately by drought; yet it is a better crop than last year. *Lee*: Doing finely; will be full average if the season continues favorable. *Ogle*: Some good, and some small and weedy. *Stephenson*: In most places very good. *Johnson*: Ordinary cultivation; condition excellent—better than for many years. *Macon*: Damaged by rain in June. *Mason*: Good on highlands, but poor on lowlands from excessive rain. *Pope*: Too wet season for cultivation. *White*: Crop forward and ripening finely, but will yield only 40 per cent. of a full crop. *Morgan*: Still in danger of frost.

WISCONSIN.—*Dunn*: High temperature and frequent showers of August brought out the crop finely; large ears and plenty of them; two weeks of good weather will save the crop; one slight frost which did no harm. *Washington*: Chinchies took the crop when the corn was too far advanced to do much injury, but they damaged the fodder greatly. *Clark*: Crop fast maturing under the favorable weather; promises a full average. *Columbia*: Ripening nicely. *Crawford*: Ripening fast, and will be nearly a full crop if frost holds off. *Fond du Lac*: Never better. *Richland*: Doing well. *Walworth*: Improved beyond expectation, and will be a good crop. *Outagamie*: Out of danger from frost.

MINNESOTA.—*Yellow Medicine*: Nearly ruined by drought and grasshoppers. *Redwood*: Almost destroyed by grasshoppers. *Faribault*: Large acreage; well advanced; about average in spite of a destruction of 10 per cent. by grasshoppers. *Meeker*: Full crop if not ruined by grasshoppers. *Nicollet*: Injured by grasshoppers. *Blue Earth*: Injured somewhat by grasshoppers. *Nobles*: A small amount of corn escaped the grasshoppers.

IOWA.—*Benton*: Never better. *Poweshiek*: Backward. *Wayne*: Average; fifteen days late. *Crawford*: Shortened 30 per cent. by grasshoppers. *Hancock*: Never better; safe from frost. *Hardin*: Doing well. *Harrison*: Crop extra, but grasshoppers reduced it to an average. *Henry*: Fine weather bringing up the discouraging condition of corn. *Howard*: Promising, and out of danger from frost. *Humboldt*: Injured somewhat by grasshoppers. *Jefferson*: Brought out some by favorable weather in July and August; where nothing was expected from ten to fifteen bushels were raised. *Johnson*: Greatly improved in August by favorable weather; the late plantings will be average if frost keeps off. *Washington*: Nothing on wet, flat lands; average on dry lands. *Calhoun*: Looks well, except some "trimmed" by grasshoppers. *Cherokee*: Would have been very heavy but for grasshoppers, which cut it down 25 per cent., especially late plantings. *Greene*: Injured by grasshoppers. *Audubon*: Injured by grasshoppers. *Sac*: Cut down 25 per cent. by grasshoppers.

MISSOURI.—*Chariton*: Ravaged by field-mice when first planted, and subsequently injured by excessive rain and drought; a third of a crop. *Clay*: Shortened by excessive rain in spring and by drought in summer. *Buchanan*: Very promising. *Cass*: Weedy from excess of rain in spring; yet a good average. *Greene*: Largest crop ever raised here. *Johnson*: Suffering from drought; blades yellow and ears small. *Harrison*: Maturing finely. *Nodaway*: Promising, but late. *Saint Charles*: Late plantings promise finely. *Crawford*: Nearly ruined. *Mississippi*: Greatly improved within the last month. *Perry*: Good; season favorable for maturing. *Ralls*: Injured by wet weather preventing cultivation. *Cape Girardeau*: Good. *Pettis*: Fair crop in spite of heavy rains. *Candler*: Severely injured by rains and floods; old white selling at 50 cents per bushel. *Caldwell*: Much corn planted late. *Carroll*: Worst corn season for years, but the county is full of old corn. *Cole*: Very excellent. *Dent*: Injured by drought in the greater part of the county. *Holt*: Rapidly maturing, with a prospect of little or no soft corn. *Mason*: Under average. *Newton*: Continued drought has reduced a bountiful crop to

20 per cent. below average. *Phelps*: Benefited by recent rains, but the quality of this crop is inferior to that of the last year. *Dallas*: Shortened by drought. *Saint Francis*: Late rains greatly benefited late plantings; late corn will be the best if frosts hold off.

KANSAS.—*Douglas*: In fine condition; ears large and plump. *Marshall*: Crop nearly out of the way if the grasshoppers do come. *Republic*: Destroyed by grasshoppers. *Mitchell*: Early plantings nearly out of the way of grasshoppers, which are here by the million; late plantings will suffer; stalks loaded with them. *Franklin*: Benefited by recent rains; will equal the enormous crop of last year; on uplands and bluffs it is better than last year; lowlands weedy; one farmer has agreed to deliver 1,000 bushels at 20 cents per bushel. *Jackson*: Crop No. 1; somewhat injured by storms. *Marion*: Best crop ever raised here. *Nemaha*: Better than even the superlative crop of last year. *Pawnee*: Looks well in spite of the May and June drought; too far advanced to be injured by grasshoppers, except a few pieces of late-planted sod-corn. *Smith*: Injured by hail and drought about the 1st of August. *Washington*: Grasshoppers present and destroying leaves of corn, but not injuring the kernel. *Doniphan*: Very good. *Ellis*: Injured by drought in June; late corn riddled by grasshoppers. *Reno*: Grasshoppers will take late plantings; two-thirds of the crop too far advanced for them. *Norton*: Ruined by grasshoppers. *Allen*: Good. *Barton*: Late corn injured by grasshoppers. *Chase*: Still good; too far advanced for grasshoppers should they come. *Graham*: Destroyed by grasshoppers. *Miami*: Brought out wonderfully by August rains; unusually heavy crop on the largest acreage ever planted. *Rice*: Mostly out of the way of grasshoppers, but they are taking pieces of late-planted sod-corn. *Woodson*: Another vast surplus crop. *Montgomery*: Good crop.

NEBRASKA.—*Gage*: Grasshoppers present, but have not yet injured the corn more than 15 per cent. *Knox*: Entirely destroyed by grasshoppers. *Otoe*: Yielding grandly. *Cuming*: Late plantings injured by grasshoppers. *Dodge*: Half the crops destroyed by grasshoppers. *Webster*: Slightly injured by grasshoppers, but full average. *Franklin*: Half taken by grasshoppers. *Adams*: Half the crop taken by grasshoppers. *Hall*: Clean sweep by grasshoppers. *Merrick*: Late crops suffered from grasshoppers. *Saunders*: Greatly damaged by grasshoppers. *Seward*: Grasshoppers swept the crop. *Thayer*: Injured by grasshoppers. *Boone*: All late plantings destroyed by grasshoppers. *Lancaster*: Grasshoppers. *Platte*: Injured early crops and destroyed late ones. *Wayne*: Late corn injured by grasshoppers; three-fourths of a crop will still be gathered. *Antelope*: Swept by grasshoppers. *Pawnee*: Never better. *Furnas*: Destroyed by grasshoppers.

CALIFORNIA.—*Siskiyou*: Damaged by frost August 29.

OREGON.—*Clackamas*: Summer too cool for corn. *Tillamook*: Minnesota corn from the Department the best for early plantings.

COLORADO.—*Fremont*: Three-fourths destroyed by grasshoppers. *Weld*: Nearly destroyed by grasshoppers.

WHEAT.

In the July report an improvement was noted in the condition of winter-wheat, bringing it up to 95. The August returns indicate that spring-wheat yielded less than three-fourths of a crop; it was still further reduced during that month by insect-ravages and unfavorable conditions of growth and ripening, so that the condition of the whole crop averages but 81. The actual yield will be the subject of further investigation.

In New England only the small crops of Massachusetts and Connecticut were in full condition. Complaints of injury from extreme heat and from the midge have been received from some of the northern portions of this region. The grain did not fill well, and hence was short in both weight and bulk.

In the Middle States the large crops of New York and Pennsylvania were below 100, the former 12 per cent. and the latter 4 per cent. In some cases the crop ripened too fast, and consequently the grain was imperfectly filled. Minorea wheat has had a satisfactory trial in Schuyler, New York, while the Clawson and Fultz are favorites in several counties in Pennsylvania. New Jersey and Delaware indicate high condition, but their surplus is not sufficient to meet the deficiency of the two larger States.

Maryland and Virginia are each 2 per cent. above 100, but the other South Atlantic States show a deficiency which decreases with the latitude to a minimum of 66 in Georgia. In Maryland conflicting reports in regard to the popularity of the Fultz wheat have been received. In Harford millers object to it as a flouring-wheat, and farmers indicate a purpose to sow less of it hereafter; in Calvert, Carroll, and Baltimore a different feeling is expressed, and this variety will be more extensively sown in the future. The Hessian fly was troublesome in Carroll. The Virginia correspondents on the whole are encouraged by the results of their wheat harvest; some farmers in Geesville realized 20 bushels of grain for each bushel of seed sown. The Fultz is well spoken of in several counties. In Loudoun millers were offering \$1 per bushel, which the farmers found to be far more satisfactory than shipping to outside markets, in which case the various commissions generally reduce the farmer's share to 60 or 70 cents per bushel. In North Carolina insects, rust, and smut reduced the yield and impaired the quality of the grain. In Davidson County the heads turned grayish white and became shriveled. In some localities, however, the crop was satisfactory, and here it has to a considerable extent superseded cotton. The same influences were felt in different counties in South Carolina and Georgia. In Towns County, Georgia, Fultz wheat does very well, especially on low lands; in Gilmer the Jennings wheat was very satisfactory, but in Terrell the Jennings and Clawson are too late in ripening for the local climate.

The crop was very poor in all the Gulf States, Alabama showing less than two-thirds of an average condition. The Tappahannock is a favorite in some sections, the Fultz not having its usual success. Mississippi and Texas harvested over three-fourths of a crop. Fultz was not successful in those counties that have noted its experimental growth. In Victoria, Texas, seed imported from California yielded 40 bushels per acre.

All of the southern inland States were below 100 except West Virginia, 105. In Independence, Arkansas, the Tappahannock failed entirely through rust, while the Walker wheat was quite satisfactory. In Tennessee scab and smut reduced the crop in some localities. The Fultz and Jennings seed from the Department yielded well. In Braxton, West Virginia, the Fultz was less affected by chinchies than other varieties. Good reports of the Fultz, Clawson, and Jennings come from several counties in Kentucky.

All of the States north of the Ohio River indicate low condition, ranging from 89 in Ohio to 58 in Wisconsin. Winter-wheat was here considerably reduced by winter-killing. The midge and Hessian fly were destructive, while in a few cases the chinch had put in an appearance before the grain was harvested. These enemies were still more destructive to the spring-wheat which was longer subjected to their ravages. A great falling off in spring-wheat is especially noticeable in Illinois, which, according to our August returns, did not gather over a third of a crop. In Coshocton, Ohio, the Fultz wheat, from seed sent out by the Department three years ago, is pronounced by both farmers and millers the best ever raised in the county. Several other counties in this region express the same preference. Orange, Indiana, reports an average yield of 32 bushels per acre, while others ranged from 5 to 20 bushels. Of spring wheats the Arnautka succeeded well at several points in Michigan, while its failure in different counties of Illinois may be referred to the extraordinary influences which have injured the

spring-wheat crop generally. Clawson and Mediterranean are also popular in many counties.

West of the Mississippi the crop is also below 100, ranging from 57 in Iowa to 92 in Missouri. In the western portions the grasshoppers were especially destructive to late crops. Drought was also very severe in some localities. The heaviest losses fell upon the spring-wheat crop which was longest exposed to the destructive influences of insect and weather. The crop in Nebraska, where grasshopper ravages were most severe, shows the greatest reduction. Howard, Iowa, complains of a short yield and very low prices, only 60 cents per bushel. Cole, Missouri, reports the White Cliff variety as excellent for hills and uplands; millers prefer it to the Tappahannock. Barton, Kansas, found the Arnautka from the Department to yield double of any other variety, but its hard, flinty shell injured its reputation with the millers.

The Pacific States were also below 100. In several counties wheat that seemed heavy at harvest thrashed out far short of expectations, this grain being shrunken by excessive heat. San Joaquin, California, complains of low prices, \$1.45 per cental, about 87 cents per bushel. In Oregon, excessive rains in spring and extreme heat in summer reduced the average weight. Our few reports from the Territories do not indicate a promising crop. In La Plata, Colorado, an excessive growth of sunflowers cut down the crop, producing smut.

Frost is noticed at several points in Utah. In Tooele the Fultz was a failure from shrinking.

MAINE.—*Piscataquis*: Fine; late sown the best. *York*: Did not fill well. *Waldo*: But little raised; crop average.

VERMONT.—*Orleans*: Did not fill well; midge and hot weather.

RHODE ISLAND.—*Warren*: Thrashed out better than it promised at harvest.

CONNECTICUT.—*Litchfield*: Good quality, but winter wheat nearly a failure.

NEW YORK.—*Warren*: Drought. *Montgomery*: Poor yield and quality; winter-killed. *Genesee*: Better than was anticipated. *Livingston*: Less plump than usual. *Schuyler*: Minorca wheat the best yet tried here. *Erie*: Yield below expectations.

NEW JERSEY.—*Sussex*: Shortened by drought.

PENNSYLVANIA.—*Chester*: Fine crop, but too suddenly ripened, and hence its milling quality greatly depreciated. *Tioga*: Shortened by drought 25 per cent. *Lancaster*: Ripened too fast; the best Fultz wheat will yield but 25 bushels per acre, with straw enough for 35 bushels. Clawson wheat from the Department not successful. *Columbia*: Much shrunken. *Bedford*: Yields well; berries plump. *Armstrong*: Clawson wheat from the Department did very well; 4 quarts produced $1\frac{1}{2}$ bushels. *Blair*: Fultz one of the leading varieties. *Clearfield*: Light. *Westmoreland*: A splendid crop. *Potter*: Rusted. *Sullivan*: Rusty and light in weight. *Lehigh*: Shriveled some in ripening.

MARYLAND.—*Prince George's*: Above average. *Howard*: Slow starting in spring, but good. *Harford*: Fultz wheat the best crop, but as millers object to it as a flouring-wheat there will be less sown hereafter; Clawson rather inferior. *Calvert*: Fultz the favorite; yields better than any other variety. *Baltimore*: Turns out well; Fultz good everywhere, and will be extensively used. *Carroll*: Turning out well; Fultz the best variety, though infested with the fly.

VIRGINIA.—*Smyth*: Did not thrash out as well as was expected; quality good. *Orange*: Yield poor; injured by frost of May and extreme heat of June. *Russell*: Thrashed out less than was expected; quality good. *Prince William*: Quality poorer than last year. *Rockingham*: Best for several years. *Madison*: Yielded well in some localities; others half a crop. *King George*: Less than was expected; quality good. *James City*: Yield good; quality No. 1; harvested and thrashed at the right time. *Floyd*: Fultz and Clawson from the Department both excellent. *Dinwiddie*: Fine harvest-weather; Fultz the favorite, yielding about thirteen fold, while other varieties do not exceed seven fold. *Greenville*: The crops have done wonderfully; some farmers have realized twenty fold. *Bland*: Better saved than last year. *Loudoun*: Not over 11 bushels per acre; county mills give \$1 per bushel, which is better than shipping to outside markets, in which case commissions of various kinds reduce the farmer's share to 60 and 75 cents per bushel. *Charles City*: Neither Minorca nor Jennings yielded well; inferior to the Fultz. *Grayson*: Clawson and Fultz wheats from the Department very fine. *Highland*: Good quality, but short. *Westmoreland*: Short of expectations and of inferior quality. *Richmond*: Damaged by rain.

NORTH CAROLINA.—*Greene*: Injured by rust and smut. *Chowan*: Very good. *Iredell*: Thrashed out only a half crop. *Davidson*: Injured by late spring frost and bugs; ripened irregularly and much not at all; head turned grayish-white and became shriveled. *Person*: Very good. *Wilkes*: Thrashed out about half a crop. *Perquimons*: Better than for many years; replacing cotton on some farms. *Buncombe*: Cut off half by rust. *Polk*: Injured by rust.

SOUTH CAROLINA.—*Clarendon*: Acreage increased but not the average yield.

GEORGIA.—*Gilmore*: Fultz proves to be well adapted to our climate; it does well on low lands. *Upson*: Half a crop and of poor quality. *Terrell*: Jennings and Clawson wheats too late for the climate. *Jackson*: Almost a failure. *Dooly*: Best crop since the war. *Towns*: Jennings wheat from the Department does very well; suits the climate. *Carroll*: Rust and flies injured the crop. *Wilkes*: Injured by frost, rust, and bad weather while in the shock. *Lincoln*: Yield exceeds last year's.

ALABAMA.—*De Kalb*: Half average and of poor quality. *Crenshaw*: Above average. *Calhoun*: Failed; Fultz poor; Tappahannock, from the Department, the only success; the spring-wheat rusted.

MISSISSIPPI.—*Winston*: Fultz wheat from the Department a failure; white wheat and white oats stand a poor chance here.

TEXAS.—*Dallas*: Average 12 bushels per acre; quality inferior. *Ellis*: Some rust. *Cooke*: Almost a failure except the Mediterranean. *Williamson*: Damaged in the shock. *Collin*: Jennings and Fultz badly rusted. *Red River*: Thrashed out light. *Kaufman*: More or less damaged throughout the county. *Upshur*: Damaged by rust. *Kendall*: Good harvest weather. *Titus*: Cut down by rust. *Coryell*: Free from smut and of good quality but one-fourth short in quantity. *Bandera*: Fully made. *Victoria*: Wheat from California seed brought 40 bushels per acre. *Hunt*: Very inferior; chinchies and other destructive causes have been at work.

ARKANSAS.—*Johnson*: Injured in shock and stack. *Sevier*: Almost a failure. *Arkansas*: Full crops. *Independence*: Tappahannock a failure; rust; Walker the best variety.

TENNESSEE.—*Wilson*: About average. *Greene*: Heavy straw; grain injured somewhat by scab or spot. *Blount*: Half crop of inferior quality. *Trousdale*: Dull sale at 75 cents. *Loudon*: Thrashed out beyond expectation. *Tipton*: A failure. *Fentress*: Good crop. *Shelby*: Fine harvest season. *Sequatchie*: Damaged by rust, spot, and smut; harvested in poor condition; Jennings yielded sixteen fold; Clawson has rusted two seasons in succession. *Grundy*: Tolerable. *Putnam*: Fultz and Jennings from the Department have done remarkably well.

WEST VIRGINIA.—*Raleigh*: Very fine. *Braxton*: Fultz the best variety for the soil and climate; stands winter-freezing best. *Hardy*: Excellent in quality and quantity. *Mercer*: Good but not in proportion to the amount of straw. *Monroe*: Excellent in quality but yield not very large. *Jefferson*: Thrashing out beyond expectation.

KENTUCKY.—*Garrard*: Two quarts of Jennings from the Department produced a bushel; two quarts of Clawson, three pecks. *Shelby*: Yield below average but grain plump and fine. *Nicholas*: Yield not heavy but the grain is good. *Madison*: About all thrashed; quality fine. *Carroll*: Shortened by drought in May. *Jessamine*: Jennings wheat from the Department very satisfactory both in yield and quality. *Lincoln*: Superior, both in quantity and quality; Fultz ahead of other varieties. *Mason*: Fine quality but light yield; Fultz and Clawson very satisfactory.

OHIO.—*Wayne*: Fine yield for the amount of straw. *Coshocton*: Fultz wheat from seed sent out by the Department three years ago, is considered by farmers and millers the best variety ever cultivated in the county. *Delaware*: Half crop but of good quality. *Geauga*: Excellent quality, but the quantity less than usual; many fields winter-killed; experiments with Fultz and Jennings very satisfactory. *Sandusky*: Half a crop. *Luron*: Crop fair and of better quality than last year. *Clermont*: Good.

MICHIGAN.—*Marquette*: Eight quarts of Arnautka, sown May 18, yielded five bushels of fine grain August 18. *Iosco*: Winter-wheat not so good as last year; spring-wheat, a fair crop. *Alpena*: Wheat has done well, but has not equaled the extra crop of last year, when many fields averaged 50 bushels per acre; this year it runs from 30 to 40; Clawson wheat does well here. *Delta*: Warm, wet weather prevented a good deal of the wheat from filling well. *Lapeer*: Somewhat shrunk in ripening. *Barry*: Clawson wheat does finely after two years' trial; "Gold Medal" wheat turned out poorly. *Grand Traverse*: Shrunk by extreme heat while filling. *Leelanaw*: Late-sown spring-wheat shrunk by drought while in its milky stage in July. *Lenawee*: Grain light in proportion to the straw; ripening ten days too soon on account of rust and heat. *Tuscola*: Fine harvest weather. *Alcona*: Winter-wheat badly rusted and shrunk; spring-wheat only fair. *Calhoun*: Injured somewhat by heavy rains at blossoming. *Charlevoix*: Spring-wheat rusted. *Mecosta*: Winter-wheat the poorest crop we have ever raised here. *Saginaw*: Not over a half crop. *Shiawassee*: Much injured by excessively wet weather and by the midge. *Mason*: Harvested in fine condition. *Oakland*: Harvested in fine order; good weather; Clawson the most popular variety; Gold Medal winning favor.

INDIANA.—*Clark*: Good quality; harvest weather good; Fultz did not meet with

striking success. *Kosciusko*: Arnautka a failure. *Decatur*: Thin on the ground, but well grained. *De Kalb*: Injured by weevil and spring-freezes. *Saint Joseph*: Fultz yields better than any other variety; will be largely sown hereafter. *Franklin*: Light in yield, but of good quality and well harvested. *Knox*: Fultz the most popular variety; Tappahannock next. *Orange*: Thin on the ground, but of good quality; from 5 to 20 bushels per acre; Fultz, 32; Mediterranean, 14. *Pike*: Largest crop yet raised in the county; selling at 75 and 80 cents per bushel. *Warren*: Grain good; better than for several years. *Washington*: Grain good and well saved. *Wabash*: Half the crop taken by the weevil.

ILLINOIS.—*Bureau*: Almost a failure. *Carroll*: Nearly a total failure; 25,000 acres as good as lost. *De Kalb*: Small breadth sown; a failure. *Franklin*: Injured by rust in some parts of the county. *Jefferson*: Grain fine in most localities; a large breadth will be sown this fall. *Madison*: Good in some parts; light in others. *Mercer*: Spring-wheat will scarcely pay for harvesting. *Piatt*: Small breadth, but of good yield and quality; Fultz succeeds well; 2 bushels came from 2 quarts of seed. *Shelby*: Injured by excessive rains. *Winnebago*: Will not pay the cost of harvesting and thrashing; many farmers are buying wheat and flour from last year's crop. *Clark*: Short one-fourth, but of good quality and well saved. *Hamilton*: Sprouted some in the shock; that in the granary is in good order. *Lee*: Very near a failure. *Ogle*: From a fifth to a fourth of a crop will be realized; *Arnautka* wheat from the Department a failure. *Mason*: Fall-wheat good; spring-wheat a failure. *Pope*: A little damaged in the shock by rain. *Morgan*: Small breadth; crop better than was expected.

WISCONSIN.—*Dunn*: Some fields will not pay for harvesting at ruling prices in the northern parts of the county. Chinch bugs did not attack the *Odessa* when other varieties were near. *Washington*: Ruined by rust on the leaves, rot at the roots, and chinchies. *Clark*: Injured by excessive rains in July and August. Both winter and spring wheat below average. Fultz the best adapted to the climate; Tappahannock does not do well as it does not mature in time to escape rust. *Brown*: Greatly damaged by chinchies and weevil. *Columbia*: Light crop; six or seven bushels per acre on an average; few kernels in the head and many kernels shrunk; chinchies at work. *Crawford*: Poorest crop for many years, averaging not over seven bushels per acre. *Dodge*: Ranges from zero to thirty bushels per acre. That known as *Maine* wheat and by several synonyms succeeds the best; the crop will not average over 7 bushels per acre. *Fond du Lac*: Reduced by rust, Hessian flies, and chinchies to an average of not over 8 bushels per acre. *Walworth*: A failure; light in weight. *Green*: Our small sowing mostly taken by chinchies. *Adams*: Light crop; grain good. *Monroe*: Good condition, but light yield and poor quality; riddled by chinchies; not over half a crop. *Pierce*: Thrashes out short.

MINNESOTA.—*Yellow Medicine*: Injured severely by drought and grasshoppers. *Redwood*: Cut short by grasshoppers; average yield from four to ten bushels per acre. *Faribault*: Half crop; shortened by drought in June. *Jackson*: Average yield from four to six bushels per acre. *Steele*: Thrashing out about three-fourths average. *Winnona*: Short on thrashing. *Blue Earth*: Thrashing out from five to seven bushels per acre. *Isanti*: Shortened by drought. *Nobles*: A small portion escaped the hoppers. *Wabasha*: Surplus for export not a third of last year's surplus.

IOWA.—*Adams*: Averages 4 bushels per acre; quality good. *Benton*: Good quality; yield averages 7 bushels per acre. *Poweshiek*: Almost an entire failure. *Wayne*: Spring-wheat a failure; not one acre in a hundred harvested. *Jackson*: Spring-wheat will not return the seed sown. *Mitchell*: Half crop; good quality. *Hancock*: Short crop and good quality; will not average over 8 bushels per acre. *Hardin*: Light yield, but full, plump grain. *Howard*: Two-thirds of an average and only 60 cents per bushel; poor prospect. *Humboldt*: Thin on the ground, but grain of good quality. *Taylor*: Killed by rust. *Washington*: Nearly a failure. *Calhoun*: Very poor; best crops not over 12 or 14 bushels per acre; many not over 3 to 5 bushels; grain generally good. *Tama*: Light in yield and weight; averages about 7 bushels per acre and 50 pounds per bushel. *Cherokee*: Slightly damaged by grasshoppers; yield 8 to 10 bushels per acre. *Floyd*: Much wheat yields but 4 bushels per acre. *Marion*: Yield 1 to 10 bushels per acre; average not over 5; medium quality. *Audubon*: Good quality, but only 8 bushels per acre. *Sac*: Light yield.

MISSOURI.—*Hariton*: Injured by rust and rain during harvest. *Clay*: Harvested and stored in fine order. *Jefferson*: Half crop, and more or less damaged in the shock; Fultz the most successful. *Greene*: Harvested two-thirds of an average crop, and afterward injured in the shock. *Johnson*: Grain plump and heavy, but badly weather-beaten. *Nodaway*: Spring-wheat all killed with rust; winter, an average, well harvested. *Crawford*: Nearly ruined. *Mississippi*: Good average, and saved in better order than last year. *Perry*: Does not redeem its promise at harvest on thrashing out. *Ralls*: Injured by wet in the shock, and, on bottom-lands, by floods. *Cape Girardeau*: Crop short. *Pettis*: Nearly average in quantity and above average in quality; somewhat injured by rain in the shock. *Camden*: Injured severely by heavy rains and high waters; the last named has inflicted damage in the county to the farming inter-

est of not less than \$150,000. *Carroll*: Harvest wet and wheat more or less damaged. *Cole*: "White Cliff" wheat excellent for hills and uplands; straw stiff and ears long; millers prefer it to the Tappahannock. *Newton*: Thin on the ground; berry tolerably good; housed in good order. *Phelps*: Poor in yield and quality. *Dallas*: Badly rusted.

KANSAS.—*Jackson*: Crop good; berry plump. *Marion*: Much injured by rust; did not thrash out according to the promise of harvest; many fields did not pay for harvesting. *Nemaha*: Winter-wheat good; spring-wheat a failure. *Paucene*: Shortened by drought in May; acreage three times that of last year. *Smith*: Chinchies took some pieces of spring-wheat; we have just raised our first crop of winter-wheat. *Doniphan*: Fall-wheat good, but spring-wheat was a failure. *Ellis*: Injured by drought in June; Minorea, from the Department, yielded 8 bushels per acre, and Jennings 25 bushels, with plump berries and heads averaging 4 inches in length; the last named is considered a very valuable seed for the climate. *Saline*: Winter-wheat poor, owing to drought and rust; spring-wheat yielded well, but the grain was too hard to be marketable. *Allen*: Fultz in universal demand for seed. *Barton*: Arnautka spring-wheat from the Department; it doubled the yield of any other variety, but the grain is hard and flinty, which injures its reputation with the millers. *Chase*: Will not average over 7 bushels per acre; poorest crop in ten years. *Woodson*: Plenty at 90 cents per bushel; 15,000 bushels to spare. *Montgomery*: Shortened by excessive rain at blooming-time; will not average over 12 bushels per acre; good quality.

NEBRASKA.—*Lincoln*: Grasshoppers. *Platte*: Grasshoppers too late for the crop. *Antelope*: About 13 bushels per acre; quality good. *Nemaha*: Injured somewhat by rains in harvest. *Richardson*: Grasshoppers took a third of the spring-wheat.

CALIFORNIA.—*Marin*: Crop of the State largely in excess of any former year; acreage and yield in the county about equal to last year. *Merced*: Thrashes out 30 or 40 per cent. short of what was expected at harvest. *San Joaquin*: Half crop; low price, \$1.45 per cental; many shipping on their own account. *Contra Costa*: Promise of extra crops not realized; shrunken by excessive heat. *Stanislaus*: Short on thrashing. *Del Norte*: Fine harvest weather.

OREGON.—*Douglas*: Excessively wet winter and spring caused late seeding, and hot days in July prevented the grain from filling. *Linn*: Fall-wheat lighter than was expected; spring-wheat nearly average and of superior quality.

COLORADO.—*La Plata*: Low average of the crop due to the enormous growth of sunflowers springing up since the rainy season commenced, about the middle of July; crop smutted; some fields half smutted.

UTAH.—*Summit*: Severe frost. *Morgan*: Severe frost. *Toelle*: Best crop ever raised here; selling at 50 cents per bushel in cash; Fultz wheat a failure; shells too easy when ripe, and cannot be handled without loss. *Utah*: Crops on bench-lands do not meet the farmer's expectations.

OATS.

The condition of the oats crop, which averaged 86 on the 1st of August, declined to 81 on the 1st of September. It reached 100 only in Maine, Massachusetts, Rhode Island, Delaware, South Carolina, Georgia, Florida, and Michigan. Each of the great leading sections of the Union, taken together, shows low conditions. New England reports the highest condition, 98. In some of the northern counties of this region late sowings were a comparative failure on account of drought. The Middle States together were about 7 per cent. below average. Here late plantings suffered from drought and rust, making both yield and weight very light. Schuyler, New York, pronounces the Waterloo the best variety for that climate.

The South Atlantic States, as a whole, are 5 per cent. below 100, South Carolina and Georgia being above. In some of the northern counties of this region rust and heat, causing premature ripening, made the crop short and light in weight. Farther southward winter sowings were the most successful, spring sowings in many cases resulting in total failure. Carroll, Maryland, prefers the Schonen to all other varieties. The Gulf States, as a whole, are about 9 per cent. below average; Florida 105, showing the maximum, and Alabama 88, the minimum. The causes of decline are mostly those conditions of growth which produce rust. The red rust-proof and yellow-beard rust-proof are

favorites in several counties. The latter was introduced into Henry County three or four years ago; it is said to be more economical as a food for stock than corn, being raised and harvested at a much smaller expense. Prices in local markets rule low; Harris, Texas, reports 30 cents per bushel as the average price. Winter sowings are more general, and of these the earlier sown seem to secure the best results.

The inland Southern States all report low condition, ranging from 98 in West Virginia to 52 in Arkansas; this section, as a whole, is 16 per cent. below average. Drought and rust are alleged as reasons for the shortness of the yield and the lightness of the weight. The Red Rust-Proof is the favorite, especially in the southern counties. In the northern counties, where spring sowings are more common, these are especially light, while the winter sowings are generally promising. The region north of the Ohio River, which produces two-fifths of the crop of the country, shows the most depressed condition, being 24 per cent. below average on the whole; the States range from 56 in Illinois, the greatest oats producing State in the Union, to 100 in Michigan. Several localities in the latter State enjoyed a very favorable combination of meteorological conditions; the copious rains of June being followed at the right time by the genial heat of July, not too great to prevent the full maturity of the grain. In the more southern counties this happy combination did not exist to any great extent. Excessive rains caused a rank growth, which extreme heat ripened prematurely; rust also formed on the crop, and other causes operated to shorten the yield and render the grain light and shrunken. The disproportion of grain to straw is of frequent mention in our reports; in many cases crops were not worth cutting, and live stock were turned upon them to graze. Marquette, Michigan, expresses a strong preference for the Holstein, which there made a remarkably fine growth this year. The crop shows a still lower condition in the States west of the Mississippi River, the whole taken together averaging but 66; the States range from 36 in Kansas to 78 in Minnesota. Drought, rust, and excessive rains are alleged in different counties as injuring the crop in different stages of its growth. The destructive grasshoppers injured this crop seriously in Western Minnesota and Iowa, and at several points in Kansas and Nebraska. Hardin, Iowa, complains at once of a poor crop and of low prices, farmers not being able to realize over 20 cents per bushel in the local markets. Instances of fields not worth harvesting are mentioned in widely-different portions of these States.

The Pacific States average about 92. Marin, California, attributes her low yield largely to the bad policy of seeding the same land to oats for many years without intermission. No drought is ever felt there, while the rolling ground furnishes a sufficient surface-drainage to prevent injury from successive rains. In La Plata, Colorado, sunflowers, which injured wheat, also grew up in the oats field, overshadowing and seriously injuring them. The grasshoppers attacked the crop at several points in the Territories. At some points in Utah crops were injured by early frosts.

MAINE.—*Penobscot*: Good. *Waldo*: Very good.

VERMONT.—*Grand Isle*: Injurious drought; late sowings almost worthless.

NEW YORK.—*Warren*: Drought. *Schoharie*: Short and light. *Montgomery*: Weight 20 to 24 pounds per bushel. *Otsego*: Light. *Westchester*: Very light; drought. *Genesee*: Light yield. *Wyoming*: Shrunken by rust. *Niagara*: Destructive drought and heat. *Schuyler*: Waterloo the best yet raised here. *Erie*: Yield below expectation.

NEW JERSEY.—*Warren*: Straw short.

PENNSYLVANIA.—*Elk*: Fine promise reduced to half average. *Columbia*: Poorly filled and light. *Bedford*: Suffered from rain. *Beaver*: Badly rusted. *Butler*: Light

weight; poorly filled. *Westmoreland*: Crop large but grain light. *Potter*: Rusted; late plantings failed. *Berks*: Best crop for three years. *Forest*: Much injured by rust.

MARYLAND.—*Prince George's*: Below average. *Howard*: Poor, but better than usual. *Baltimore*: Late sowings ripened too fast. *Carroll*: Turning out well; Schonen takes the lead.

VIRGINIA.—*Russell*: Rusted considerably. *King George*: Yield excellent. *James City*: Fall sown good, partly making up for the deficiency of the spring sown. *Warwick*: Spring sowings failed; fall sowings yield fine crops besides abundant spring grazing. *Prince George*: Spring-oats almost a universal failure; winter-oats a fair crop. *Northampton*: Crops short; spring-oats weigh not over 24 pounds per bushel. *Richmond*: Damaged by rain.

NORTH CAROLINA.—*Union*: Very light; drought. *Alamance*: Winter sowings good; spring sowings failed. *Buncombe*: Rusted. *Polk*: Rusted; rains excessive at maturing season.

GEORGIA.—*Jefferson*: Much above average. *Upson*: Finest crop ever grown. *Jackson*: Remarkably good crop. *Oglethorpe*: Best in several years. *Dooley*: Best crop in twenty years. *Carroll*: Rusted. *Lincoln*: Increased yield.

ALABAMA.—*De Kalb*: Tolerable yield in spite of rust. *Henry*: Yellow-beard rust-proof oats successful.

TEXAS.—*Dallas*: Average 40 bushels per acre. *Ellis*: Some rust. *Williamson*: Early sown superior. *Red River*: Thrashed out light. *Upshur*: Heavier than last year. *Titus*: Very fair, especially the red rust-proof. *Harris*: Better than ever; jobbing at 30 cents per bushel.

ARKANSAS.—*Clay*: Ruined by rust, especially late sowings. *Arkansas*: Full crop. *Bradley*: Except the red rust-proof variety, oats have entirely failed.

TENNESSEE.—*Wilson*: Very heavy. *Greene*: Spring sowings injured by rust and spring frosts; winter sowings fine, with clean straw and heavy grain. *Blount*: Half crop of inferior quality. *Union*: Badly damaged by rust. *Tipton*: Almost average; less rust than last year. *Fentress*: Pretty good. *Shelby*: Fine harvest season. *Grundy*: Almost a failure.

WEST VIRGINIA.—Damaged by wet. *Preston*: Acreage greater than for fifteen years. *Raleigh*: Very fine. *Hardy*: Unusually fine.

KENTUCKY.—*Nicholas*: Half a crop. *Carroll*: Cut short by drought in May. *Lincoln*: Rusted; straw of no value.

OHIO.—*Ross*: Damaged by rain. *Delaware*: Large crop, but rather chaffy. *Geauga*: Heavy strawed, but badly lodged and poorly filled; the increased average will make good the diminished yield. *Sandusky*: Very poor. *Huron*: Fair crop; grain not very heavy. *Lorain*: Grain not in proportion to straw; large white kinds will average 37 pounds per bushel.

MICHIGAN.—*Marquette*: Holstein oats remarkably fine. *Menomonee*: Injured by the early rains. *Lapeer*: Very good. *Lenawee*: Light berry. *Charlevoix*: Light. *Mecosta*: Materially reduced by blight. *Saginaw*: Not one-half crop. *Oakland*: A good crop, well secured.

INDIANA.—*Clark*: Crop short, but grain good; the Surprise-oats from the Department in 1875 have done very finely. *Kosciusko*: Holstein did well; will give it further trial. *Decatur*: Ruined by rust; straw heavy, but grain light; not half will be harvested at all. *Franklin*: Ruined by rust. *Warren*: Yielding well. *Washington*: Greatly injured by rust. *Brown*: Killed by rust.

ILLINOIS.—*Carroll*: Light in yield and weight and low in price; 25,000 acres sown. *Clinton*: Drowned out. *Crawford*: Badly rusted; a large portion not worth cutting. *De Kalb*: Much rusted and shrunken; not over 21 pounds per bushel. *Effingham*: Rust from wet weather. *Franklin*: Shortened by rust resulting from wet weather in the forepart of the season. *Jefferson*: Grain light in weight; straw heavy. *Madison*: Light and poor; rust. *Marshall*: Almost ruined by rust. *Piatt*: About half the standard weight. *Shelby*: Injured by excessive rains. *Warren*: Promised well, but reduced a third in yield by rust; weigh but 23 pounds per bushel. *Winnebago*: Will not pay the cost of harvesting and thrashing. *Woodford*: But a small portion of the crop will be thrashed; excessive wet produced rust. *Hamilton*: Light weight. *Ogle*: Light crop. *Stephenson*: About two-thirds the average weight per bushel. *Macon*: Damaged by rust. *Mason*: Very light. *Pope*: Light; injured by rust.

WISCONSIN.—*Clark*: Greatly injured by excessive rains in July and August. *Brown*: Thrash out light; yield small. *Fond du Lac*: Little over half a crop. *Walworth*: A failure; lightest crop in thirty years. *Green*: Badly rusted; from 20 to 25 pounds per bushel.

MINNESOTA.—*Yellow Medicine*: Nearly all taken by grasshoppers. *Redwood*: Cut off by grasshoppers; from 8 to 20 bushels per acre average yield. *Jackson*: Ten to 15 bushels per acre. *Nicollet*: Ravaged by grasshoppers. *Steele*: Range from very poor to good; generally good. *Isanti*: Shortened by drought.

IOWA.—*Adams*: Mostly destroyed by rust; light and poor. *Poweshiek*: Light

Wayne: Very light; rusted. *Crawford*: Severely injured by blight. *Hancock*: Badly rusted; many crops not worth harvesting. *Hardin*: Light weight; rust. *Howard*: Light in weight and poor in quality; bring but 20 cents per bushel. *Jefferson*: Very little worth thrashing; do not weigh over 20 pounds per bushel. *Taylor*: Killed by rust. *Washington*: Nearly a failure. *Iowa*: Looked splendid; but were taken by rust when just filling. *Cherokee*: Yield 20 to 30 bushels per acre. *Floyd*: Light weight. *Sac*: Light yield.

MISSOURI.—*Clay*: Almost an entire failure from rust and wind. *Buchanan*: Half a crop; rust. *Greene*: Rusted badly. *Johnson*: Three-fourths ruined by rust. *Nodaway*: Nearly destroyed with rust. *Crawford*: Nearly ruined. *Mississippi*: Nearly ruined by wet; Holstein oats, from the Department, superior to all others. *Perry*: Half-crop; rust. *Ralls*: Damaged by rains; did not fill out. *Camden*: Rust very destructive; many crops not harvested; market-price for old crop, 25 cents per bushel. *Carroll*: Did not fill. *Newton*: Almost ruined by rust; not more than half the fields were cut. *Phelps*: Ruined by rust; crops very light. *Dallas*: Damaged by rust.

KANSAS.—*Jackson*: Almost ruined by rust. *Marion*: Rusted and light; many fields not cut. *Nemaha*: Suffered greatly from rust. *Pawnee*: Shortened by drought in May. *Doniphan*: Nearly ruined by wet weather. *Chase*: Almost a total failure. *Woodson*: Rust; selling at 20 cents per bushel. *Montgomery*: Failure; killed by rust.

NEBRASKA.—*Knox*: Riddled by grasshoppers; many fields not harvested. *Otoc*: Blasted. *Lancaster*: Grasshoppers. *Wayne*: Escaped grasshoppers; good condition. *Antelope*: Good. *Pawnee*: Almost a failure through rust.

CALIFORNIA.—*Marin*: Below average; farmers here are in the bad habit of sowing the same land to oats, sometimes as often as ten or twelve years successively. No drought ever felt here, while the rolling surface prevents injury from excessive rains. *Humboldt*: Destructive rust from late sowing and foggy weather in July.

OREGON.—*Linn*: Good.

COLORADO.—*Fremont*: Half destroyed by grasshoppers. *La Plata*: Injured by the spontaneous and excessive growth of sunflowers in the fields since the rainy season of July began. *Weld*: Badly injured by grasshoppers.

UTAH.—*Summit*: Slightly injured by frost.

RYE.

The condition of the crop is below 100 in the great majority of the States; it makes its best showing on the Atlantic and Pacific slopes. It was subject to the same extremes of heat and drought as the wheat-crop, but escaped with a smaller percentage of loss on the whole. The States full average or above are Vermont, Massachusetts, Rhode Island, Delaware, Florida, West Virginia, Kentucky, and Nebraska. The minimum, 75, is found in Arkansas, where grain-crops generally met with unfavorable conditions of growth.

NEW YORK.—*Niagara*: Destructive drought and heat.

NEW JERSEY.—*Sussex*: Shortened 25 per cent. by drought. *Bedford*: Extraordinary yield.

PENNSYLVANIA.—*Clearfield*: Light. *Lehigh*: Fair in quantity, but not so plump as could be desired.

MARYLAND.—*Prince George's*: Below average.

VIRGINIA.—*Madison*: Good.

NORTH CAROLINA.—Injured by rust and smut.

GEORGIA.—*Jefferson*: A little over average. *Dooly*: A good crop.

TEXAS.—*Dallas*: Averaged 40 bushels per acre. *Upshur*: About equal to last year's crop. *Titus*: Light; cut by rust.

ARKANSAS.—*Arkansas*: Full crops.

KENTUCKY.—*Shelby*: Grain plump, but yield small. *Lincoln*: Good, sound, and well cared for.

INDIANA.—*Decatur*: Thin on the ground, but well grained.

ILLINOIS.—*Ogle*: Winter-rye generally good. *Stephenson*: Light crop, but of fair quality. *Walworth*: Medium crop.

KANSAS.—*Jackson*: Never better. *Doniphan*: Good crop.

BARLEY.

The barley-crop is in fall condition or above, in only a few States, viz: Vermont, Rhode Island, South Carolina, Georgia, and Alabama, which, taken together, produce less than 1 per cent. of the crop of the country.

The great barley-producing States return the condition as follows: California, 98; New York, 89; Illinois, 57; Iowa, 79; Ohio, 88; Wisconsin, 88; Minnesota, 71. In these States, which raise five-sixths of the crop, the average condition of the whole is but 87. The crop of the whole country is at least 10 per cent. below 100. In Wayne, New York, the straw failed to yield grain; a result attributed to intense heat. In the East it was injured by drought and in the West by rain. In several counties of Illinois the crop was too poor to pay for harvesting. In the extreme Northwest it was exposed for a while to the ravages of grasshoppers. In Marquette, Michigan, the Golden Melon turned out finely, while in Doniphan, Kansas, the Probestier proved quite an acquisition. Wayne, Nebraska, complains that her crop is too high-colored for brewing.

VERMONT.—*Orleans*: Good; more raised than formerly.

NEW YORK.—*Genesee*: Good. *Wyoming*: Very fine. *Niagara*: Destructive drought and heat. *Livingston*: Less plump than usual. *Fates*: Thrashes out light.

TEXAS.—*Dallas*: Harvested 50 bushels per acre. *Red River*: Tolerable yield. *Titus*: Light crop; rusted.

OHIO.—*Ross*: Damaged by rain.

MICHIGAN.—*Marquette*: Golden Melon barley turns out very fair; shall give it a more extended trial next season. *Delta*: Good.

INDIANA.—*Franklin*: Injured by heavy rains in harvest; generally musty.

ILLINOIS.—*Winnebago*: Will not pay the cost of harvesting and thrashing. *Ogle*: Very poor. *Stephenson*: Light crop in quantity and indifferent in quality.

WISCONSIN.—*Brown*: Light crop. *Walworth*: Moderate.

MINNESOTA.—*Yellow Medicine*: Taken by grasshoppers. *Steele*: Generally good. *Rock*: Nearly escaped the grasshoppers.

IOWA.—*Poweshiek*: Light. *Howard*: Good yield.

MISSOURI.—*Nodaway*: Cut short by wet weather in early spring.

KANSAS.—*Jackson*: About average. *Doniphan*: Injured by wet weather. *Barton*: Probestier barley quite an acquisition.

NEBRASKA.—*Otoe*: Light. *Wayne*: Escaped grasshoppers, but is too high-colored for the brewers. *Antelope*: Good.

CALIFORNIA.—*San Joaquin*: Three-quarters of a crop.

COLORADO.—*Weld*: Badly injured by grasshoppers.

UTAH.—*Summit*: Slightly injured by frost.

BUCKWHEAT.

The acreage in buckwheat was increased in the more northern sections of the Union, especially in the New England and Pacific States, all of which report a larger breadth than last year. The midsummer drought prevailing in portions of the Middle States reduced the area devoted to this crop, especially in New Jersey, which reports an acreage less than three-fourths of that of 1875. The South Atlantic States about equal their previous acreage. None of the Gulf States report any culture of this cereal except Texas, which returns a decrease of 27 per cent. The States of the Mississippi Valley, on the whole, about equaled their acreage of 1875, Nebraska increasing about a third, and Kansas and Missouri decreasing about one-ninth. The Pacific States increase about 3 per cent.

The condition of the crop in New England was good on the whole at the close of July, but from drought and other causes it was reduced from 8 to 20 per cent. during August. The Middle States had their visitation of drought at a critical time for this crop, and consequently, with an unpromising start in July, many counties report it still poorer in August, while in one or two localities early frosts complicated the difficulties of the situation. In the South Atlantic States the small crop improved somewhat during August. In Highland, Virginia, Silver hull from the Department was the favorite seed. A farmer here, by

selection of the best Silver-hull heads, obtained a flowerless variety, a peck of the seed sown on an acre yielding 25 bushels. The crop of the Gulf States is inappreciable except in Texas, where the condition is about a fourth below average. It is somewhat below in the inland Southern States on the whole, having been reduced during August. In all the States north of the Ohio River the condition declined, except in Indiana. Early frosts here injured the crop in several localities. West of the Mississippi it was reduced in all the States, especially in those counties visited by grasshoppers. The crop of Nebraska was cut down nearly one-half during August. The crop suffered considerable reduction in the Pacific States, where it is 8 or 9 per cent. below average.

VERMONT.—*Grand Isle*: Shortened by drought. *Rutland*: Suffered from drought.

CONNECTICUT.—*New London*: Not seeding as much as usual; too hot and dry.

NEW YORK.—*Greene*: Without speedy rain the crop will be a failure. *Schoharie*: Not half a crop. *Delaware*: First frost; slight damage to buckwheat. *Dutchess*: No rain for six weeks; half crop. *Broome*: Affected by drought. *Allegany*: Spoiled by drought and heat. *Columbia*: Injured by drought.

PENNSYLVANIA.—*Tioga*: Nearly ruined by heat and drought. *Bedford*: Very promising. *Beaver*: Some farmers think that buckwheat is too exhausting to the soil, and sow it more sparingly. *Armstrong*: Suffered from drought in August. *York*: Promising. *McKean*: Greatly shortened by drought. *Cameron*: Greatly injured by drought. *Wayne*: A failure. *Northampton*: No rain for six weeks; very poor. *Cambria*: Crop extra if frost holds; looks well. *Warren*: Some lowland crops frosted August 20. *Potter*: Drought and frost severe on the crop. *Lawrence*: Looks well. *Lycoming*: Very short. *Wyoming*: Half destroyed by drought.

VIRGINIA.—*Prince William*: Seeded late, but will be a fine crop if the frost delays. *Highland*: Promises well, but not certain till thrashed. Silver hull the best variety. A farmer has discovered a new variety, by selecting the best heads of the Silver hull. A quarter-peck of this seed produced 25 bushels; it has no blossom, and forms grain from the ground up. The grain is larger than ordinary and somewhat rough.

TEXAS.—*Titus*: Doing finely.

TENNESSEE.—*Fentress*: Crop fine.

WEST VIRGINIA.—*Preston*: Average greater than for fifteen years. *Mercer*: Looks fine.

MICHIGAN.—*Delta*: Good. *Tuscola*: Injured by early frost. *Muskegon*: Only raised on light lands, and there it did not fill well; too dry and hot.

INDIANA.—*Kosciusko*: Golden Melon a failure. *Decatur*: Promising. *Stark*: Half the crop killed by frost August 20.

ILLINOIS.—*Hardin*: Buckwheat from the Department has done well; well suited to soil. *Effingham*: Too wet. *Madison*: Not yet in seed.

MINNESOTA.—*Steele*: Generally good.

IOWA.—*Harrison*: Destroyed to a great extent by grasshoppers. *Humboldt*: Nearly ruined by grasshoppers. *Greene*: Destroyed by grasshoppers. *Sac*: Nearly destroyed by grasshoppers.

MISSOURI.—*Nodaway*: Never better.

KANSAS.—*Graham*: Destroyed by grasshoppers.

NEBRASKA.—*Osage*: Swept by grasshoppers. *Merrick*: Ruined by grasshoppers. *Seward*: Grasshoppers destroyed 80 per cent. of the crop. *Boone*: Destroyed by grasshoppers. *Antelope*: Swept by grasshoppers. *Nemaha*: Injured by rains in harvest.

COLORADO.—*Weld*: Destroyed by grasshoppers.

COTTON.

• The September returns, while averaging a higher condition than is usual in this month, are lower than those of August. This decline is usual; it is almost inevitable. After the spring floods and frosts, which often affect the plant unfavorably in limited areas, there is usually a sunny season, very favorable to growth, powerful in repairing the losses of the early spring and summer; but when the time of fruitage approaches and vitality becomes impaired the critical period of the crop is at hand, the autumn rains appear, winds and floods are liable to destroy, blight comes with decay, lice abound, the caterpillar becomes abundant by reproduction. If any or most of these fail to appear by

September 1st the planter is more fortunate than usual and the decline less than the accustomed ratio. It is possible for a crop to improve in condition in August, but the reverse is oftener the case.

In North Carolina the decline has been from 96 to 93, caused by excessive moisture and rust; in South Carolina, from 97 to 91, from blight caused by great extremes of heat and moisture; in Georgia, from 104 to 90, by drought mainly, and in less degree by rust and caterpillars; in Florida, from 89 to 83, by worms and rust; in Alabama, from 103 to 83, from causes similar to those operating in Georgia, with greater prominence of the caterpillar; in Mississippi, from 92 to 87, mainly from too much rain, with some injury from the boll-worm and caterpillar; in Texas, from 106 to 87, from various causes operating either together or separately in the different sections, as drought, rains, rust, boll-worm, and caterpillar. In Tennessee and Arkansas the decline is scarcely perceptible, amounting to but 1 per cent., and in Louisiana there is a gain of 1 per cent.

For the last five years, the September averages have been as follows:

States.	1876.	1875.	1874.	1873.	1872.	1871.	1870.
North Carolina.....	93	90	87	95	101	82	105
South Carolina.....	91	80	86	86	95	80	105
Florida.....	90	76	77	90	96	78	105
Georgia.....	83	75	77	85	92	75	115
Alabama.....	83	87	81	85	88	80	100
Mississippi.....	87	98	74	82	90	80	100
Louisiana.....	90	88	62	80	86	77	105
Texas.....	87	94	65	92	94	80	109
Arkansas.....	97	99	47	93	78	95	110
Tennessee.....	119	96	52	92	92	96	100
Average.....	92.3	88.3	70.4	88	91.2	82.3	105.7

The following extracts from September returns are given as indices of local peculiarities of the crop-history:

VIRGINIA.—*Sussex*: Very fine prospect.

NORTH CAROLINA.—*Wilson*: Fine rains to August 10 greatly improved the crop, but the rust afterward showed itself generally, reducing its promise. *Onslow*: Too much weed, and less heavily balled than last year; will open later. *Union*: Opening very fully; best crop since the war. *Orange*: Rather too much rain. *Jones*: Excessive rain caused shedding on light, weak soils; opening fast, and will be speedily gathered. *Greene*: Cold weather in July caused general rust in August, shortening the crop 25 per cent. by shedding. *Columbus*: Season favorable; no worms or rust. *Cumberland*: August rains cut down the crop to an average one; some rust. *Chowan*: Injured by rust. *Beaufort*: A very large crop cut down to average by excessive rains. *Iredell*: Greatly improved by August rains. *Nash*: Rusted considerably on light highlands; doing well on stiff soils. *Wayne*: Shortened 25 per cent. by rust. *Mecklenburgh*: August crop very good; weed not large, but bolls heavy and blooms abundant and full; no insects. *Pamlico*: Injured by rains in August. *Perquimons*: Shortened by excessive rains; shedding forms and bolls. *Gaston*: Started late, but doing well. *Edgecombe*: From very good to very bad; three or four days earlier than last year. *Carteret*: Fair prospect. *Camden*: Good crop. *Hertford*: Shortened at least a third in the upper townships by rains falling for fifteen days. *Wake*: The great injury inflicted by the rains of July was aggravated by the drought of August; opening rapidly.

SOUTH CAROLINA.—*Edgefield*: Extreme heat and drought following copious rains cut cotton from 120 to 80; injury especially apparent on highly-manured crops. *Newberry*: Many blooms failed to perfect forms on account of excessive rain, yet the yield is promising and of good quality. *Darlington*: Extreme heat and drought following excessive rains have made the cotton to scald and shed; crop still large, but not in proportion to the weed. *Barnwell*: Shortened by drought. *Horry*: Yield less than last year. *Chester*: Seriously injured by drought and rust within the last fifteen days. *Beaufort*: Caterpillars have appeared in sea-island cotton on the mainland, but not in great numbers. *Clarendon*: Injured by heavy rains. *Williamsburgh*: Injured by rust in consequence of excessive rains; has shed badly in many places; yield still promises

20 per cent. more than last year. *Marlborough*: Extreme drought and heat; premature opening of bolls; seeds small and light. *Chesterfield*: Rust comes later than usual, but is very general. *Lexington*: Average crop; opening splendidly. *Marion*: Rust general; bolls small, and hands gather only three-fourths the average amount per day. If the weather remains dry most of the crop will be gathered by the end of September. *Union*: Injured by recent drought.

GEORGIA.—*Twiggs*: Injured by heavy rains, followed by drought. *Stewart*: Unfavorable weather, drought and black rust; caterpillars present on the fresh bottom-lands where the crop is late; considerable shedding. *Jefferson*: About average. *Upson*: Great destruction from drought in all uplands. *Whitfield*: Injured by drought. *Terrill*: Took rust much earlier than usual, which has damaged the crop seriously; crop will be gathered by October 15; never opened so early before. *Macon*: Drought has played havoc; cotton-fields look as they usually do in November; 40 per cent. already open; 90 per cent. will be gathered by October 1. *Jackson*: Decreased acreage; looks well. *Floyd*: Injured by drought commencing July 20, also by grasshoppers. Some rust in bottom crops. *Dodge*: Rust is shortening the crop. *Clayton*: Within two weeks heat and drought have greatly reduced the crop; forms shedding. *Bulls*: Heat and drought have reduced the condition of cotton 10 per cent. within fifteen days; rust already showing itself. *Baldwin*: Reduced 30 to 40 per cent. since August 1. *Walton*: Some complaint of shedding, but, on the whole, cotton appears in fine condition. *Richmond*: In lower part of the county fine rains have raised the crop above average; in the upper part drought has reduced it below. *Oglethorpe*: Suffering from heat and drought. *McDuffie*: Reduced 10 per cent. by drought. *Fulton*: Shedding badly from drought. *Dooley*: Shortened 20 per cent. by rust; no top crop except on new lands, on which rust is not likely to come. *Worth*: Drought has cut cotton down to half a crop. *Heard*: Shedding badly; some rust. *Hancock*: Drought has played havoc with the crop so promising at last report; rust is also destructive; most of the cotton has ceased making, and a large portion is leafless and dead. *Harris*: Cut down to an average by drought and worms. *Baker*: Badly rusted in some places. *Thomas*: Rusted badly. *Troup*: Drought since August 12; small bolls, shedding as fast as they come out. *Seriven*: Badly rusted; middle crop shortened, and top crop cut off. *Pulaski*: Badly rusted; drought over a third of the county. *Muscookee*: Rust and caterpillars. *Elbert*: Fine season. *Carroll*: Drought causing plants to shed; nearly half the August crop has fallen. *Barlow*: Injured by drought and grasshoppers. *Wilkes*: Fertilized upland crops losing nearly all their forms and small bolls; larger bolls opening prematurely. *Coweta*: Greatly parched up. *Columbia*: Drought beginning to tell on the crop. *Cobb*: Drought caused shedding of forms. *Early*: Caterpillars riddled the crop in spots. *Henry*: Reduced one-third by drought of twenty days. *Lincoln*: Shed profusely from August drought. *Taylor*: Seriously injured by rust within two weeks. *Wilcox*: Rusted very badly; growth stopped. *Polk*: Drought damaging a very fine crop.

FLORIDA.—*Jackson*: Rust and worms destructive. *Columbia*: Looking well; caterpillars have just appeared. *Madison*: Caterpillars in the western part of the county, but no great damage yet; rust has appeared, and the crop is opening rapidly; weather dry. *Jefferson*: Caterpillars badly injuring the crop; they threaten to close it out by the middle of September; rust, also, is very general; weed small, but well fruited; labor reliable. *Gadsden*: Deteriorated since last report; rust prevalent everywhere; dry hot weather stimulates the opening of the bolls.

ALABAMA.—*Dallas*: Since August 20 caterpillars have stripped the plants of their foliage, inflicting a loss of 40 per cent. on the crop as it previously promised; no remedies have been found successful. *Etowah*: Where good conditions of growth have been enjoyed the plants are well stalked, but poorly fruited; if frosts delay, the yield may approximate an average. *Morgan*: Two weeks' drought has greatly damaged the most promising crop we have had for years. *Limestone*: Shedding badly from drought. *DeKalb*: Runs too much to weed. *Crenshaw*: Rust and worms; crop average on sandy land. *Clarke*: Large weed; caterpillars plenty. *Conecuh*: Caterpillars greatly damaging the top crop. *Autauga*: Caterpillars by the million; seem to be closing out the crop. *Perry*: Two-thirds of the county swept by caterpillars; they have destroyed the leaves, squares, and small bolls; they are moving northeast, according to their custom; the flies preceded them ten days; they fed greedily on figs, rotten apples, cider-pumice, &c.; they remained about a week. *Franklin*: Two months' rain; crop injured same. *Coffee*: Shedding; excessive rains in some parts; rust and worms in others. *Clay*: Excessive rains have stimulated the top growth so as to cover and overshadow the bottom fruit, preventing the bolls from a full development. *Russell*: Considerable rust and worms; crop opening fast. *Monroe*: Weed large, but not well fruited; young cotton doing well; worms in some places. *Bullock*: Injured by rust and caterpillars; the poor condition of bottom crops reduces the general condition 25 per cent. below average. *Lowndes*: Reduced by worms and wet weather. *Jackson*: Too much rain. *Hale*: Caterpillars have reduced the crop to three-fourths of an average. *Greene*: Caterpillars at work; there will be a fair bottom crop, half a middle crop, and no

top crop; the whole will be about half an average. *Chambers*: Fine growing season. *Blount*: Very fine condition; weed well developed and full of bolls. *Marengo*: Completely stripped by caterpillars. *Lauderdale*: Weed large, but lightly balled; worms numerous. *Colbert*: With a late fall the crop will be large. *Pike*: Worms all over the county; cotton-fields filled with speckers; shortened 15 to 20 per cent.

MISSISSIPPI.—*Rankin*: Some injury from floods and rust; worms have appeared. *Lee*: Excessive rains produced rust and shedding; boll-worms also destructive. *Kemper*: A failure; not possibly over a half-crop; caterpillars have stripped the stalks clean within ten days. *Claiborne*: Improved during August. *Lincoln*: Too much rain in August caused the young bolls to fall off; reduced 10 per cent. *Adams*: Shortened some by drought, but seasonable weather promises its improvement; caterpillars have appeared, but their operations do not indicate any serious damage. *Tishomingo*: Growth good; season favorable. *La Fayette*: Injured by drenching rains in the first half of August. *De Soto*: Injured 10 per cent. by cool, dry weather for the last ten days. *Choctaw*: Looks well to date. *Lowndes*: Caterpillars stripping the foliage completely; crop cut down 33 or 50 per cent. below average. *Covington*: Injured by excessive rains producing rust; also by worms to some extent. *Coahoma*: Excessive rains have caused early plantings to shed; both late and early have grown so large that much will be lost from rot; this will bring the yield down to about what was realized last year. *Winston*: Injured by excessive rains. *Jasper*: Rain for the last twenty days; rust and worms doing great injury. *Yalabusha*: Poor, especially on bottoms; losing forms rapidly. *Wayne*: Good; no worms yet. *Grenada*: Injured by heavy rain-storms and wet weather. *Amite*: Acreage diminished. *Lauderdale*: Equal to the best crop during the last ten years. *Clarke*: Top crop destroyed by excessive rains and caterpillars; most of the crop open. *Jefferson*: Worms; shortened 25 per cent. compared with last year; opening fast.

LOUISIANA.—*Caddo*: Drought and worms; not over three-fourths of a crop. *Franklin*: Two or three weeks late; small. *Morehouse*: Two-thirds of a crop; drought. *Washington*: Heavy rains caused shedding. *Rapides*: Drought and worms; the latter not very formidable. *La Fayette*: Improved by late dry weather. *Richland*: Crops on high lands have ceased to make, and are opening rapidly; late plantings on low lands are making and opening fast, but cannot make a full crop. *Concordia*: Injured by recent rains, especially on low lands. *East Baton Rouge*: Improved by recent rains. *Claiborne*: Reduced by drought of August. *Jackson*: Opening finely; fields white; excellent picking-weather; yield will be 20 per cent. greater than last year.

TEXAS.—*Smith*: Unverified reports of boll-worm cut down the probable condition to average; otherwise it would be about 40 or 50 per cent. above. *Nacogdoches*: Drought and boll-worms have caused considerable shedding. *Medina*: Drought caused the bolls to fall and the aftergrowth to cease. *Marion*: Best crop in five years. *Dallas*: Greatly injured by drought for three weeks. *Travis*: Two months of drought have caused serious shedding of late forms and blooms. *Rusk*: Cotton is opening well, but the boll-worm is injuring small bolls. *Polk*: Injured by wet weather and worms, but the latter have not yet done much harm; their third crop is expected to eat up the cotton; early cotton out of danger. *Burnet*: Forms and leaves falling; drought for six weeks. *Williamson*: Decreased acreage; drought injurious. *Waller*: Worms destructive, taking even the leaves of the grown bolls. *Matagorda*: Early plantings injured by rain; later taken by caterpillars; the best cotton cannot make over half a crop. *Lamar*: Boll-worms more alarming than destructive. *Brazoria*: Crop promising. *Bell*: Upland cotton 25 per cent. short from drought; sandy bottoms not much better; stiff soils but slightly injured. *Washington*: Caterpillars in the southern part of the county; too late for most of the crop. *Red River*: A few boll-worms. *Kaufman*: In excellent condition; opening fast. *Austin*: Too much weed under the rains of June and July; subsequent intense heat caused great shedding, especially on sandy uplands; worms have made a clean sweep. *Panola*: Some early cotton injured by the drought; boll-worms somewhat injurious. *Hamilton*: Early plantings injured by drought, but recent rains have brought out later plantings; older cotton shed its squares to a great extent. *Bosque*: Badly needs rain. *Bastrop*: Drought through July and August, with intense heat, cut down the crop at least one-third; a few worms. *Titus*: Crop looks fine, but plants are too large and do not show the damage of the boll-worm; yield 25 per cent. below average. *Laraca*: Injured by drought and late plantings by caterpillars. *Harrison*: Looks well; season remarkably favorable to growth and fruitage. *Coryell*: Not possible to make over a half crop. *Caldwell*: Drought and extreme heat cut down the crop one half. *Bowie*: Uplands will yield as good a crop as the lowlands; crop of better quality than usual. *Kerr*: Suffering from drought, which will shorten the crop. *Navarro*: Drought has cut down the crop from 100 to 50; a great deal is now dead, and the best of weather cannot start the remainder to any great action. *Somervell*: Drought has greatly shortened the crop; small bolls and squares have mostly dropped off, and those left will not grow as large as usual. *Victoria*: Worms have stripped the stalks and leaves, but have appeared later than last year; the plant having a fine growth will yield as largely as last year and a finer staple.

Bezar: No rain for two months; cotton shedding its top crop. *Hunt*: Boll-worms have injured the crop 25 per cent. *Newton*: Greatly improved.

ARKANSAS.—*Jackson*: Greatly injured by excessive rains; shedding fast. *Drew*: Some rust. *Dallas*: Injured by excessive rains. *Clay*: Too much weed. *Saint Francis*: Generally damaged by blight; not over half a crop; light middle crop, and no top crop, unless the weather should be favorable for the next fifteen days. *Prairie*: The extreme heat of the last ten days of August was a great benefit to cotton; opening finely. *Johnson*: Planted in too close rows for a dry season, whereas it has been wet; plants too large, especially on bottoms; bolls and squares rotting and falling. *Franklin*: Bottom crops too rank; below average; upland crops over average. *Bell*: Boll-worms bad in the bottoms; not seen yet on the uplands. *Sevier*: Shedding severely on the uplands; drought. *Nevada*: Worms have appeared. *Monroe*: Drought and heat succeeding excessive rains have caused the plants to shed considerably; weed large but not well fruited; without further disaster, the yield will still be above average. *Columbia*: Greatly shortened by drought. *Arkansas*: Still growing and not opening fast. *Independence*: Has commenced opening and looks well. *Lonoke*: Doing finely. *Craighead*: Opening finely. *Pulaski*: Continued wet weather has ruined the bottom crop. *Clark*: Some damage by boll-worms. *Ashley*: Some rust. *Bradley*: Maturing well; picking began two weeks earlier than usual. *Fulton*: Weed rank and healthy but too large, and sparsely fruited.

TENNESSEE.—*Wilson*: Looking well. *Hardeman*: Prospect gloomy; half the middle crop of fruit has fallen; rain threatens the top crop. *Gibson*: Late but thrifty. *Tipton*: Very fine; yield will be large if frosts do not come very early. *Mauvy*: Immense growth of weed; with continued fine weather and late frosts a full average crop will be made. *Shelby*: Crop will be enormous.

The following notes are from the August returns:

VIRGINIA.—*Sussex*: Cotton looks as well as I ever saw it, and promises over an average crop.

NORTH CAROLINA.—*Columbus*: Seriously injured by June rains; bad stand and small, but fruiting finely. *Duplin*: Very little growth made in July; small for the season but may yet make an average crop. *Edgecombe*: Unprecedented drought from July 2 to 28, but light rains since. *Gaston*: Belated by cold and wet in May and June, and consequently behindhand; it seems to be doing well, but a drought is impending. *Greene*: Shortened ten per cent. by drought. *Iredell*: Late and small in weed; rain must come soon if we are to get much over half a crop. *Mecklenburgh*: Good stand in a very good condition. *Nash*: Retarded, but shows no rust or disease; weed sufficiently large and fruiting well. *Orange*: Very promising. *Pitt*: Shortened by local drought. *Union*: Very good. *Wake*: Drought; local rains have raised the average prospect to three-fourths of a crop. *Wilson*: Late rains somewhat repairing the damage of former drought. *Stokes*: Drought of six weeks. *Hertford*: Good; heavily loaded with forms and bolls; yield promises to be greater than last year. *Perquimons*: Season fine for cultivation and growth. *Jones*: The prospect for a large yield of cotton was never better up to July 15; since then excessive rains have caused a destructive shedding; prospect below average.

SOUTH CAROLINA.—*Chester*: Lost 10 per cent. by drought. *Chesterfield*: Two weeks late, but looks well generally. *Clarendon*: Early wet spell caused the joints to grow large and longer than usual; subsequent dry weather enabled planters to clean the crop growing rapidly, and may make an average. *Georgetown*: Small, late, and unpromising; declined within the month. *Marlborough*: Doing well. *Newberry*: Season favorable; growth good, promising a fair August crop. *Union*: Decreased area, but full average condition; labor unusually effective, and grass well cleaned out. *Horry*: Acreage increased 25 per cent.; crop eight to ten days later than last year; recent heavy rain have injured lowland crops; those of the uplands are running too much to weed; the bolls will blight as soon as the water gets out of the ground. *Richland*: Season favorable. *Spartanburgh*: Promising. *Darlington*: Season good. *Marion*: "Honey dew" and lice have appeared, probably caused by cool nights, and give apprehensions of rust on cotton.

GEORGIA.—*Baker*: Very flattering condition, but August is our test month for cotton. *Berrie*: July drought did some damage causing it to shed fruit, and, in some cases, to rust. *Brooks*: Doing as well as usual for the season. *Carroll*: Looks finely and is full of bolls, but even a short drought would cause it to shed; some appearance of rust. *Clayton*: Very promising; if the season continues favorable the crop will be large. *Cobb*: Looks remarkably well, but is liable to attack of grasshoppers which are injuring other crops. *Coffee*: Greatly injured by drought in July. *Doole*: Needs rain; fruit beginning to shed. *Floyd*: Somewhat injured by grasshoppers. *Gwinnett*: A little late; plant not very large but well fruited; with favorable weather in August and September the crop will be a full one. *Richmond*: Weed small. *Telfair*: Full average. *Thomas*: Looks well; continuance of good seasons will secure a full crop.

Walker: Drought. *Baldwin*: Crop in a critical stage; seasonable showers give a great development of weed, flowers, and bolls, but there need a continuance of fine weather to escape injury. *Early*: Remarkably flourishing. *Jefferson*: Season remarkably propitious so far. *Lincoln*: Doing well, though two weeks later than last year; some indications of rust. *Madison*: Ten days late; stands not good on low lands. *Stewart*: Season good; cotton-flies in some localities. *Terrell*: Rust in some places; caterpillars have appeared but as yet have done no damage. *Upson*: Weed below average but well fruited. *Wallon*: Crop full average; season favorable. *Henry*: Looks fine. *Jackson*: Tolerable; reduced acreage. *Whitfield*: Injured by drought. *Wilkes*: Late but doing well. *Taliaferro*: Never better, except in a few localities injured by hail-storms; they are above average size at this point of the season and are growing and fruiting rapidly. *Forsyth*: Weed good and well fruited; rain excessive for the last few days.

FLORIDA.—*Jackson*: Doing well, and bearing heavily; full crop if no disaster befall. *Jefferson*: Well worked, but shortened by drought; some caterpillars reported. *Lery*: Prospect remarkably favorable. *Madison*: Very good; well fruited. *Gadsden*: Not improved since last report; stands bad, and fruitage defective; 25 per cent. below average; now suffering from drought.

ALABAMA.—*Baldwin*: Planted late, but growing fast and quite healthy; generally very clean. *Barbour*: Good; some little rust on sandy ground, but condition in advance of last year. *Calhoun*: Weed large, but fruitage not entirely satisfactory. *Clarke*: Crop good, but two weeks later than last year; some caterpillars, but no harm done yet. *Coffee*: Prospect better than since the war; some reports of worms. *Colbert*: Very good. *Concuh*: Doing well; clear of grass; some caterpillars reported. *Dallas*: Ten or fifteen days behind-hand; army-worm generally present. *Hab*: Two weeks later than last year; weed large, but not well fruited; caterpillars have appeared, but have webbed up; the third crop will probably be destroying the cotton in August. *Jefferson*: Crop very promising. *Macon*: Caterpillars have appeared, but no damage reported yet. *Pike*: Late, but promising. *Bullock*: Ten days late, but full average in condition; caterpillars in force on black lands; some are trying Park green. *Cherokee*: Fine growth of weed; fruiting tolerably. *Monroe*: Better than last year on uplands, but injured by excessive wet on bottoms; ten days late; caterpillars have appeared. *Morgan*: Unusually good.

MISSISSIPPI.—*Adams*: Worms reported in south part of the county. *Amité*: Acreage reduced; looks well. *Carroll*: Never more promising. *Clarke*: Some caterpillars, but no great damage yet. *Coahoma*: Tends to large weed; too much rain. *Grenada*: Promising; season favorable. *Lauderdale*: Abundant rains; crop very promising. *Neshob*: Very fine. *Perry*: Late, but more promising than at this time last year. *Wilkinson*: Damaged by drought. *De Soto*: Very promising. *Holmes*: Benefited by late rain. *Lincoln*: Improved fast during July, but backward on account of late start in the spring. *Lowndes*: Full average. *Madison*: Doing well. *Marion*: Army-worms at work; will make their grand attack about August 20; this indicates a crop 20 per cent. less than last year. *Rankin*: Injured by drought. *Claiborne*: A month late and small, but well formed and balled. *Jefferson*: Smaller than at this time last year and suffering for rain; drought for two months. *Monroe*: If no disaster occurs, our crop will be the largest since the war; labor efficient and abundant.

LOUISIANA.—*Bienville*: Cotton late, but promising. *Caddo*: Shortened 15 per cent. by drought; some worms heard of, but no damage reported. *Carroll*: Destructive drought in July. *Concordia*: Where not overflowed the crops look well, except on sandy soil, which has not had enough rain; on overflowed land very poor and six to eight weeks behind time; some worms reported; no efforts yet made to destroy them. *Franklin*: Smaller than usual; drought. *Madison*: Much improved during July; seasonable rains. *Rapides*: Small; lack of rain; condition good. *West Feliciana*: Small but healthy and doing well. *Bossier*: Crops better than for 10 years; labor in better condition. *Claiborne*: Small, but healthy and growing.

TEXAS.—*Anderson*: Twenty per cent. better than the average of past years; labor capricious and unreliable. *Austin*: Has developed weed too fast; many fields gassy; beginning to open; rumors of worms. *Bastrop*: Promising, but needs rain; acreage reduced. *Burleson*: Growing fast and beginning to open. *Burnet*: Still backward; retarded by drought. *Caldwell*: Best crop since the war. *Collin*: Good condition; promises an extra yield; acreage slightly reduced. *Dallas*: Never better. *Harrison*: Remarkably fine; no shedding of squares as in former years. *Henderson*: Very large for August. *Kendall*: Prospects excellent. *Laraca*: Crop late, but the best for many years; picking has begun. *Matagorda*: Oldest cotton poorly balled; late cotton scarcely any fruit yet. *Medina*: Drought. *San Jacinto*: Crop late but promising, except where there has been too much rain. *Somervell*: Very fine; if no rainfalls in ten days it will begin to shed. *Titus*: Fine prospect, though excessive rain as enlarged the weed too much. *Upshur*: Larger than last year, but the blooms are less numerous. *Washington*: Weather very propitious. *Williamson*: Condition full average; acreage slightly reduced. *Wood*: Large, clean and full-fruited; some gins of

boll-worm. *Angelina*: Very fine. *Bexar*: Looks well, but needs rain. *Brazoria*: Greatly improved during July. *Colorado*: Injured by drought and worms. *Hunt*: Prospect very favorable. *Marion*: Best crop ever raised here, but worms have appeared. *Rush*: Very good crops; 5 per cent. above average. *Smith*: Promise extra: hot days and warm nights. *Uvalde*: Full average. *Bosque*: Crop promises to be much better than last year; stand good and well cultivated; plants loading heavily with forms and fruit; rain needed. *Tannin*: Too rank weed for a heavy crop; some fields overflowed. *Lampasas*: Beginning to suffer from drought.

ARKANSAS.—*Clay*: Late and growing to weed. *Columbia*: Promising, though late: continued seasonable rains. *Fulton*: Healthy and growing; blooms and bolls abundant. *Lonoke*: Excellent growing season. *Monroe*: Too much rain in some places for cotton, which is beginning to shed squares; in other places the crop is promising. *Nevada*: Better than for many years. *Perry*: Rather too much rain. *Prairie*: Running to weed. *Stone*: Season fine; prospect excellent. *Yell*: Never more promising. *Arkansas*: Damaged 35 or 40 per cent. by high water. *Calhoun*: Excessive wet, causing shedding. *Clark*: Injured by heavy rains. *Jefferson*: Looks well but needs rain. *Sevier*: Too much rain.

TENNESSEE.—*Gibson*: Prospect good. *Hardeman*: Very promising. *Lincoln*: Doing well. *McNairy*: Prospect never better. *Maury*: Outlook very good. *Rutherford*: Greatly superior to the crops of 1874 and 1875. *Shelby*: Prospect very encouraging.

POTATOES.

Returns for August 1 indicated a condition for the entire crop averaging about 94. The States above 100 were, in the North, Maine, 103; in the interior, Delaware, 106; Tennessee, 108; Kentucky, 103; in the South, South Carolina, 101; Georgia and Texas, 105; west of the Mississippi, Arkansas, 106; Missouri, 103; Kansas, 105; Nebraska, 107; California, 101. Among States producing heavy crops New York returned 88; Pennsylvania, 93; Ohio, Indiana, and Illinois, 95; Michigan, 90.

Drought was the leading cause of reduction. In Rhode Island, where the condition was reduced to 42, Washington reported no rain for forty-seven days following June 5. The next lowest, 60, was in New Jersey, where drought was general and severe. It was quite general, though less severe, in North Carolina, Louisiana, Wisconsin, and Minnesota. Local effects of dry weather, reducing condition in a less degree, were noted in Massachusetts, Connecticut, New York, Pennsylvania, Virginia, and Iowa. Returns generally indicate that the beetle, where present, had been less ravenous than heretofore. In Vermont and Massachusetts its presence was noted in a majority of returns, but they agreed in representing it harmless. In New Hampshire, in Cheshire, farmers were "still fighting the beetle," but in Hillsborough it had done very little injury. Its ravages were more extensive in New York and Michigan. Its presence, with slight injury, was also reported in Connecticut, New Jersey, Pennsylvania, Kentucky, Ohio, Indiana, Illinois, and Dakota Territory. Indications of rotting were only reported in a single county each in Louisiana, Illinois, Oregon, and Washington Territory.

The September returns report extensive injuries to the crop in August by drought throughout the Northern States, and by grasshoppers in Minnesota, Kansas, and Nebraska, and to a less extent in Iowa and Colorado. Eight counties in New York and two in Pennsylvania report more or less injury by the Colorado beetle; a dozen other States specify the same cause for reduction, each in a single county only. In Hamilton, Illinois, "the old-fashioned potato-bug" damaged the late crop. Rust or blight is noted only in Chautauqua and Wyoming, New York; Pulaski, Virginia; Iasco and Montcalm, Michigan; Outagamie, Wisconsin; and Humboldt, California. In Utah the crop was considerably damaged by an unprecedented frost August 9. The condition falls

largely below 100 in nearly all the States producing heavy crops: New York, 57; Pennsylvania, 74; Ohio, 84; Illinois, 92; Michigan, 64; Maine, 82; Wisconsin, 94; Iowa, 97; Indiana, 83; Vermont, 91; New Hampshire, 92; New Jersey, 45; Missouri, 95. Among other States in which the crop is a staple, the following return a low condition: Massachusetts, 65; Connecticut and California, 63; Maryland, 89; Virginia, 86; Kansas, 93. The States reporting above average are, North Carolina and Kentucky, 101; Alabama, 105; Mississippi, 106; Texas, Arkansas, and Tennessee, 104.

The notes below are from the September returns.

MAINE.—*York*: Few and small. *Penobscot*: Late potatoes suffering for rain. *Franklin*: Shortened 50 per cent. by drought. *Piscataquis*: Suffering from drought. *Oxford*: Injured much by a severe drought of six weeks. *Waldo*: Prospect of a light crop. *Cumberland*: Injured by drought.

NEW HAMPSHIRE.—*Carroll*: Badly injured by drought. *Cheshire*: Too dry.

VERMONT.—*Franklin*: Shortened by drought. *Grand Isle*: Apparently ruined by drought. *Rutland*: Have suffered from a drought of six weeks, and in some localities from beetles. *Windsor*: Late potatoes damaged by severe drought. *Orleans*: Not quite average in yield, but good in quality.

MASSACHUSETTS.—*Worcester*: Very light drought. *Hampshire*: Reduced by drought and the beetle to 40. *Hampden*: Many pieces an entire failure; drought. *Plymouth*: Have suffered from dry weather.

CONNECTICUT.—*New London*: Severely injured by the beetle; small, and the yield not more than 50 per cent.

NEW YORK.—*Greene*: Late potatoes hardly worth digging; drought. *Washington*: The lightest crop ever grown; drought. *Schoharie*: Not half a crop; the driest for twenty years. *Montgomery*: Very fine and dry. *Saratoga*: Injured by drought. *Chautauque*: Will not be 10 per cent. of an average, owing to beetles and rust. *Genesee*: Shortened by drought. *Onondaga*: Late potatoes ruined; the beetles and drought have spoiled the crop. *Kings*: All harvested and sold. *Warren*: A failure threatened from drought. *Dutchess*: Reduced 50 per cent. by drought. *Madison*: Injured by severe drought. *Orange*: Much injured by the beetle. *Wyoming*: Struck with blight; will not be half a crop. *Browne*: Reduced by drought and beetles. *Ontario*: A light crop; drought. *Schuyler*: The beetles entirely destroyed many fields. *Sullivan*: Scarcely half a crop; drought and beetles. *Suffolk*: Beetles have proved very destructive. *Erie*: Light.

NEW JERSEY.—*Cumberland*: Look well where the beetle has been kept off. *Ocean*: Owing more to drought than to the beetle, many farmers will not get their seed back, and not one in twenty will have enough for home use. *Mercer*: Have suffered seriously from drought.

PENNSYLVANIA.—*Cambria*: The large tops dying off fast, without producing an average crop. *Northumberland*: Destroyed by the great drought. *Wayne*: A failure; no rain since July. *Blair*: Have suffered from the intense heat. *Butler*: Few and small; drought. *Cameron*: Injured by the very dry and hot August. *McKean*: Badly injured by drought. *Monroe*: Reduced by the severest drought ever known. *York*: Rapidly maturing; promise well. *Armstrong*: Have suffered from drought in August; early potatoes were extra good. *Bedford*: Less in quantity but better in quality than last year. *Elk*: Very light crop. *Tioga*: Materially shortened by extreme drought. *Chester*: A poor crop owing to drought and the beetle. *Warren*: Greatly reduced by protracted drought. *Indiana*: A large crop; in excess of demand. *Lekigh*: Cut short by drought and the beetle. *Sullivan*: Tops all died prematurely; poor crop. *Lycoming*: Very poor in quantity and quality.

MARYLAND.—*Montgomery*: Seriously injured by drought.

VIRGINIA.—*Dinwiddie*: The late crop almost a failure. *King and Queen*: The late crop making nothing, owing to the beetle; early potatoes were good. *Russell*: Very good. *Elizabeth City*: Late potatoes injured by drought. *Pulaski*: Mostly dug, and found to be badly rotted.

NORTH CAROLINA.—*Greene*: A good crop.

GEORGIA.—*Dooly*: Very fine. *Fulton*: The best yield ever made. *Brooks*: Being injured by drought. *Decatur*: Very much damaged for want of rain. *Jefferson*: Excellent.

FLORIDA.—*Gadsden*: A large acreage; suffering from drought. *Hamilton*: Doing well.

MISSISSIPPI.—*Greene*: Good. *Hancock*: Short crop, from protracted drought.

TEXAS.—*Caldwell*: Cut short one-half by drought. *Titus*: Never better. *Uphur*: The finest ever raised in the county; many 3½ inches in diameter. *Hunt*: The largest

crop ever known here. *Newton*: The late planting almost a failure; too hot and dry.

TENNESSEE.—*Monroe*: Never better. *Greene*: Heavy yield. *Grundy*: Very promising. *Bledsoe*: Better than ever known.

WEST VIRGINIA.—*Braxton*: Very good. *Wetzel*: Favorable weather has done wonders for the crop.

KENTUCKY.—*Shelby*: But half of last year's acreage.

OHIO.—*Ashtabula*: Much injured by drought in the northern section. *Williams*: Short, from drought. *Athens*: Late, shortened by drought. *Delaware*: Good. *Sandusky*: Only enough for home consumption. *Tuscarawas*: Injured by the grub-worm. *Muskingum*: Late planted far below average, owing to drought.

MICHIGAN.—*Mason*: Not turning out as well as expected. *Kalamazoo*: Small, but good in quality. *Tasco*: Small yield, and beginning to rot. *Delta*: A good crop, and the quality first-rate. *Montcalm*: Poor crop, owing to wet weather; Early Rose affected with rot. *Hayne*: Early, light from drought; late, light from the beetle. *Calhoun*: Injured by rains. *Charlevoix*: Poor in yield and quality. *Muskegon*: Small yield, but of good quality. *Kent*: Not over half a crop; drought.

INDIANA.—*Decatur*: Late potatoes will not yield well. *Elkhart*: A failure, from beetles and wet weather. *Wabash*: Never did so well before on our bottoms.

ILLINOIS.—*Bureau*: Early, good; late, comparatively nothing. *Hardin*: Poor stand, but looking well. *Hamilton*: Early, good; late, injured by drought and the old-fashioned potato-bug. *Ogle*: Light crop. *Johnson*: Late potatoes nearly destroyed by the beetle. *Pope*: Two-thirds of a stand; do not look healthy.

WISCONSIN.—*Outagamie*: Signs of rot. *Clark*: Threatened with rot. *Brown*: Reduced by excessive wet and the beetle. *Crawford*: A big crop. *Fond du Lac*: Very light.

MINNESOTA.—*Fairbault*: Injured by grasshoppers 50 per cent. *Nicollet*: Much of the crop destroyed by grasshoppers. *Rock*: Reduced to 25 by grasshoppers.

IOWA.—*Benton*: Best crop ever raised. *Howard*: Beetles cleared some fields and left others untouched. *Sioux*: Reduced to 10 by grasshoppers. *Greene*: Being injured by grasshoppers. *Sac*: Injured 50 per cent. by grasshoppers.

MISSOURI.—*Nodaway*: Never better. *Caldwell*: Badly injured by weeds. *Newton*: Matured before the drought, and are good.

KANSAS.—*Jackson*: Good. *Ellis*: Injured by drought.

NEBRASKA.—*Otoe*: Grand yield. *Cuming*: Late potatoes injured by grasshoppers. *Saunders*: Largely destroyed by grasshoppers. *Wayne*: Injured by grasshoppers. *Antelope*: The beetle very destructive, and the grasshoppers finished the crop.

CALIFORNIA.—*Humboldt*: Will be a light crop; all early planted killed with blight.

OREGON.—*Clackamas*: Late.

COLORADO.—*Weld*: Badly injured by grasshoppers.

UTAH.—*Morgan*: A severe frost August 9 destroyed 33 per cent. A more severe frost on the 21st. *Summit*: Badly injured by a very severe frost on the morning of August 9. Ice was formed from one-fourth to one-half an inch thick.

SWEET POTATOES.

At the 1st of August the crop as a whole was in a promising condition. Prevalent dry weather had reduced it in Virginia to 94; in North Carolina to 96; and in Louisiana to 91. South Carolina returned an average of 99; Kentucky, 100; and all the other States in which sweet potatoes are a crop worthy of notice a higher condition; New Jersey, Mississippi, and Tennessee, 103; Georgia, 106; Alabama and Arkansas, 108; Texas, 111.

The September returns show a reduction of condition in August of 9 per cent. in New Jersey, 5 in Georgia and Ohio, 4 in Florida, Missouri, and California, 10 in Texas and Nebraska; an advance of 3 per cent. in Maryland and Virginia, 2 in North Carolina, 4 in Mississippi, and 7 in Kentucky. In the remaining States the variation from the condition at the 1st of August is slight.

VIRGINIA.—*Dinwiddie*: Promise of a good crop. *King and Queen*: Very fine. *Northampton*: Short crop; fleas seriously injured early plants.

SOUTH CAROLINA.—*Lexington*: Suffering from drought.

GEORGIA.—*Appling*: Dying from drought.

FLORIDA.—*Columbia*: Too dry for the crop. *Putnam*: Not rain enough to set sweet potatoes.

ALABAMA.—*Bullock*: Fine. *Monroe*: Large increase over any previous year in acreage. *Coffee*: More planted by half than since the war. *Conecuh*: Never better.

LOUISIANA.—*Richland*: Cut short by drought. *Lafayette*: Injured by the dry weather. *Jackson*: An abundant crop of the best quality.

TEXAS.—*Titus*: Prospect of a fine yield. *Upshur*: Large for the season. *Austin*: Promise of the largest crop for years. *Washington*: Never more promising. *Williamson*: Three weeks early, and the largest crop ever raised. *Burnet*: Suffering for rain. *Rusk*: Promise a large yield. *Marion*: Splendid. *Medina*: Reduced by drought. *Newton*: Injured by drought.

TENNESSEE.—*Monroe*: Never better. *Greene*: Very promising. *Fentress*: Will be an enormous crop.

WEST VIRGINIA.—*Braxton*: Very good.

KANSAS.—*Woodson*: Largest and best crop ever raised.

TOBACCO.

The larger tobacco States report a low condition: Maryland, 72; Virginia, 65; North Carolina, 69; Tennessee, 80; Kentucky, 77; Ohio, 97; Missouri, 87. This indicates a reduction in August of 8 per cent. in Maryland and Virginia, 4 in Tennessee, and 9 in Missouri; but a gain of 5 per cent. in Kentucky, 3 in Ohio, and no change in North Carolina. The condition averages better in States producing less quantities: Massachusetts, 103; Connecticut and West Virginia, 102; Pennsylvania, Louisiana, and Texas, 101; Georgia, 100.

In York, Pa., a promising crop is maturing rapidly. In Maryland the crop was extensively injured by drought in August; in Calvert it is firing badly from this cause. From Virginia an extraordinary attack of worms is reported in Fluvanna; much damage by a worm that eats its way into the pith of the stalk, and by grasshoppers in Franklin, and destructive work by the horn-worm in Halifax. In Mecklenburgh, the crop has improved very much since rains set in. Much of it is too late to ripen in Franklin, and the late crop is doing almost nothing in Louisa.

In Kentucky, too much rain is causing some crops to french in Carroll, but, otherwise, returns respecting the promise of quality are generally favorable. In Gallatin, the condition of the crop, on diminished acreage, is the best ever seen. In Simpson, also, though not more than 25 per cent. of a crop, is good in quality.

MARYLAND.—*Charles*: Much injured by early rains and grass. *Montgomery*: Seriously injured by the driest August for many years. *Calvert*: Smallest crop for several years; firing badly from dry weather. *Howard*: Dry weather has cut off the late plantings, but the crop will be average. *Prince George's*: So injured from drought that it did not recover after rains set in.

VIRGINIA.—*Caroline*: Not more than one-third of the usual crop can be raised. *Campbell*: The prospect very unpromising. *Cumberland*: Cannot be more than 33 per cent. of a crop, and much of that small and light. *Dinwiddie*: The early planted is looking well; late planted doing badly—barely half a crop can be made. *Madison*: Improving; some crops very heavy, but not average in quantity or quality. *Brunswick*: Almost a failure. *Fluvanna*: Not a fourth of a crop, and that suffering from an uncommon invasion of worms. *Carroll*: Excellent prospect. *Franklin*: The crop 67 per cent. less than last year, and a large portion so late that it cannot ripen. *Louisa*: Improved since last report, but not more than half a stand, and that now suffering for rain. *Orange*: Shortened by drought. *Pulaski*: Has improved since the last report. *Halifax*: Late and unpromising; horn-worms never more destructive; not half a crop will be secured.

NORTH CAROLINA.—*Person*: Though not more than 25 per cent. planted, is in good condition. *Warren*: Too much rain. *Iredell*: Good in quality, but only half a crop planted. *Orange*: The small crop will average fairly. *Stokes*: Cannot make more than 20 per cent. of a crop, and that will be late and poor. *Buncombe*: Looking well.

TEXAS.—*Titus*: Bad stand, but the condition improving. *Newton*: Injured by drought in August.

TENNESSEE.—*Weakley*: Looks well. *Smith*: Has suffered from too wet weather. *Trousdale*: About half a crop. *Gibson*: Fine. *Wilson*: The crop will be small, but the qual-

ity good. *Perry*: Almost a failure in product. *Dickson*: Only 25 per cent. of an average; failure in plants and wet weather.

WEST VIRGINIA.—*Mercer*: Above average. *Monroe*: Rather late. *Welzel*: Backward, but with a favorable season will make an average crop.

KENTUCKY.—*Webster*: Greatly improved in the last twenty days. *Cumberland*: Late. *Calloway*: Will be 67 per cent. of an average crop. *Carroll*: Too much rain; some crops injured by frencing. *Henry*: Something more than half a crop will be produced. *Logan*: Only 40 per cent. of a crop set out, and much of that eaten by the grasshoppers as soon as set.

OHIO.—*Noble*: Too wet for tobacco. *Clermont*: Now being cut.

MISSOURI.—*Nodaway*: Never better. *Lawrence*: Much larger crop than for years past. *Carroll*: Very promising.

NEBRASKA.—*Saunders*: Wholly ruined by grasshoppers.

SUGAR-CANE.

Sugar-growing in some parishes in Louisiana appears to be extending. The report from Iberia states: "The area in cultivation has been much enlarged; plantations and machinery have been greatly improved, and many plantations which have not grown cane since the war will make crops for the market this year." In the fourteen counties making returns for cane, the condition averages 95. Returns from Georgia average 101; Florida, 100; Alabama, 114; Mississippi and Texas, 107; Arkansas, (four counties,) 110.

GEORGIA.—*Dooley*: Fine, but suffering for rain in localities. *Brooks*: Being injured by drought. *Decatur*: Very much damaged for want of rain. *Upson*: Very fine. *Jefferson*: Excellent.

FLORIDA.—*Gadsden*: The condition still favorable, but rain is now needed. *Hamilton*: Doing well. *Columbia*: Half blown down.

ALABAMA.—*Bullock*: Fine. *Conecuh*: Doing well. *Crenshaw*: Never better.

MISSISSIPPI.—*Perry*: Looks well; 125. *Lincoln*: Favorable as could be desired.

LOUISIANA.—*Saint Mary's*: The season remarkably fine and the acreage considerably increased. *Iberia*: Have had excellent seasons for cane.

TEXAS.—*Harrison*: African, Creole, and Chinese cane largely planted, and it looks well; sugar-cane bids fair to become a standard production here. *Titus*: Very fine. *Upshur*: Doing well. *Newton*: Injured by drought in August.

STOCK-HOGS.

The numbers of stock-hogs reported on the 1st of September are greater in the South than at the same period last year, and less in the central corn-belt of the West. In the Eastern and Middle States, the numbers are slightly reduced by a decrease in New York, Pennsylvania, and Massachusetts, which is not fully compensated for by an increase in Northern New England and in New Jersey. Most of the States which furnish the animals for the large packing-establishments of the West are deficient, in comparison with their stock of last autumn, both in numbers and condition, though there is less falling off in the latter than in the former. The average decline in numbers is 5 per cent. The percentages of numbers and condition are, in detail, as follows:

States.	Numbers.	Size and weight.
Kentucky	85	98
Ohio	95	98
Indiana	89	96
Illinois	88	97
Iowa	102	97
Missouri	99	99
Kansas	132	111
Nebraska	129	112

The small numbers in Kansas and Nebraska, in comparison with those of Iowa and Illinois, prevent their large percentage of increase from affecting materially the average of depreciation. These eight States hold about 52 per cent. of the swine of the United States, and, in point of value, probably two-thirds of the whole, and supply to commerce nearly all of its pork-products for home-distribution and exportation, the swine of other States being used mainly for family or neighborhood supplies. Upon the supply of these eight States of the West, in conjunction with the corn-supply, must, therefore, depend the quantity for commercial distribution and the ruling prices for the season. The decline in numbers throughout the country averages 2.6 per cent.; in the pork-packing district, 5 per cent.

In some localities scarcity of stock, occasioned by extraordinary inducements for fattening during the past winter and spring, is assigned as a cause for decrease in numbers; but the general and chief cause reported for reduction in both numbers and condition is the prevalence of disease, usually designated as hog-cholera. North of the Potomac and east of the Ohio the only instance reported is in Snyder, Pennsylvania, where some farmers have lost nearly all. Disastrous effects of the disease on numbers and condition are reported in North Carolina—Chowan, Gates, and Pitt; Georgia—Elbert, Randolph, and Fulton; Florida—Hamilton, Jackson, and Suwannee; Alabama—Madison, Conecuh, and Dallas; Mississippi—Greene and Choctaw; Texas—Colorado, Titus, Kaufman; Tennessee—Monroe and Bedford, (50 per cent. have died, but the survivors in good condition;) Kentucky—Garrard, Marion, and Spencer; Ohio—Warren, Henry, and Greene; Indiana—Decatur, De Kalb, Shelby, and Marion; Illinois—Jackson, Mercer, and White; Iowa—Crawford and Washington; Missouri—Crawford, Henry, Pitts, Cole, Holt, and Randolph. Returns from other counties in Missouri, Iowa, and some other States, note the presence of cholera, so called, but not occasioning serious loss or injury. On the other hand, there is in some localities an improvement in numbers and condition, because of freedom from cholera where it had previously prevailed. Its comparative absence gives promise of a large increase over last year in Gadsden, Florida. In Richland, Louisiana, where, except on large farms, plenty of pork will be made, hogs are young and small, because of cholera for several years past; but this year there is no disease among them.

The return from Franklin, Ohio, states that there is a reduction of 10 per cent., owing to the prevalence of cholera last year, of which there are still some remains, and adds: "If all feeders would separate their hogs into small lots, give plenty of room, and keep the lots clean, I think hog-cholera would soon cease."

An abundant mast-crop is reported in various localities in Virginia, West Virginia, Kentucky, Indiana, Texas, and Arkansas. In Floyd, Virginia, "hogs will get fat in the woods, and millions of bushels of acorns and chestnuts will go to waste for want of hogs to eat them," and in Buchanan all oaks are loaded with mast. In Greenbrier, West Virginia, "a heavy mast-crop will more than make up for the deficiency in the corn-crop." In Kentucky, the finest mast-crop ever known is reported in Marion; also, in Owsley, "but no hogs to eat it;" also, remarkably fine in Livingston, upon which hogs "will get fat." In Floyd, Indiana, the oak, hickory, walnut, and chestnut trees are all loaded with nuts.

Notes of correspondents in the Southern States confirm the figures by frequent references, not only to increased numbers the present season,

but increased attention to improvement of hog-stock and to the advantages of growing, over importing, meat for home consumption.

PENNSYLVANIA.—*Snyder*: The hog-cholera has broken out within a few weeks, and some farmers have lost nearly all.

VIRGINIA.—*Northumberland*: Good condition, but very few raised—not half enough to supply the home demand. Very few raised by the colored population, who are the chief consumers. *Dinwiddie*: The high price of bacon has caused farmers to give more attention to hogs, and the stock is improving. *Floyd*: Hogs will get fat in the woods. *Prince William*: The high price of pork last year induced farmers to fatten hogs to such an extent that not many except brood-sows were left; consequently we shall have nothing except spring pigs to kill this fall. *Halifax*: More attention given to raising hogs, which are healthy and thriving.

NORTH CAROLINA.—*Nash*: Doing well and are largely on the increase. *Greene*: More hogs for fattening than for ten years. If no disease prevails this fall, the county will be self-supporting in respect to hog products, which has not been the case for ten or twelve years. *Buncombe*: Very scarce and small; no good hogs in the county. *Chowan*: About 50 per cent of our hogs have had the cholera, which continues to rage. Much of our poultry has died from the same cause. *Gates*: Hog-cholera has prevailed to an alarming extent. *Pitt*: Hogs continue to die of cholera, and no treatment yet resorted to relieves them. *Wilson*: A disposition to raise more hogs of good quality; some sickness.

SOUTH CAROLINA.—*Barnwell*: The number of hogs to report is becoming less and less, and without some improvement must soon be left out of the list.

GEORGIA.—*Elbert*: Cholera has reduced the condition of stock-hogs and the number for fattening. *Randolph*: Stock-hogs nearly died with cholera. *Dooly*: Cholera raging in some localities among hogs, but not so fatal as last year. *Fulton*: Over 20 per cent. lost by cholera.

FLORIDA.—*Gadsden*. The comparative absence of cholera this year gives promise of a large increase of stock-hogs over last year. *Hamilton*: Cholera quite prevalent among hogs during the spring and summer; has cut off at least 40 per cent. *Jackson*: Have increased in number, but the cholera has made sad havoc in some localities. *Suwannee*: Have died off badly from cholera, and the condition is bad, owing to disease.

ALABAMA.—*Madison*: Hog-cholera is prevailing in localities. Should it not abate, but few will be left to kill. *Conecuh*: Have lost at least 25 per cent. from cholera, and the surviving are in bad condition. *Crenshaw*: Doing well. *Limestone*: Our hog prospect is better than since 1860. *Dallas*: A violent type of hog-cholera is prevalent and defies all remedies yet tried. *Lauderdale*: The hog-crop is the best since the war, and will be ample for home consumption; price, 5 cents per pound.

MISSISSIPPI.—*Greene*: The business of raising hogs is so much interrupted by cholera that we sometimes almost lose stock for seed. *Coahoma*: There is a growing demand for hogs and a promise of nearly enough for home consumption next year. *Choctaw*: The decline is from cholera; the surviving hogs are inferior. *La Fayette*: The law which now makes the stealing of hogs a felony seems to have produced a most salutary effect. The hogs are not stolen nearly so much, and there is a probability that we can make our own meat this year—the first year since the war. *Perry*: Increased in numbers 25 per cent., but small in size.

LOUISIANA.—*East Baton Rouge*: Hog-raising is once more obtaining a footing, as the freedmen are stealing less and depending for a living more upon the fruits of their labor. *Richland*: People are giving more attention to the raising of hogs, and, except on large farms, plenty of meat will be killed.

TEXAS.—*Colorado*: Cholera has diminished the number of stock-hogs 50 per cent. *Titus*: Condition fair, but dying from cholera, measles, and staggers. *Panola*: Below average in number and condition, but we have plenty of food wherewith to fatten, and nothing to fear in the absence of disease. *Austin*: The number comparatively small, except in the wooded sections, where they are in good condition. *Kaufman*: Scarce owing to heavy losses from cholera. *Red River*: Some cholera, but increase in stock; fine mast, and plenty of corn. *Washington*: Not enough to use up the heavy crop of corn. *Burnet*: Stock-hogs very poor. *Fannin*: The crop will be sufficient for home use, with some surplus; the probable price, 4 cents net.

ARKANSAS.—*Independence*: Look well; abundance of acorns and of old and new corn. *Crittenden*: A marked improvement; the high price of bacon and the fine corn-crop have put the farmers to raising hogs. *Franklin*: Healthy and doing well. *Johnson*: Healthy and doing well; a fine prospect for acorns; plenty of hogs will fatten with but little corn. *Saint Francis*: Unfortunately but few to which to feed the large corn-crop. *Benton*: The increase in the past year has been wonderful, and a good portion is improved stock. *Fulton*: Plenty and in fine condition.

TENNESSEE.—*McNairy*: Fair; corn being very plenty. *Monroe*: Scarce, for both stock and pork, owing to cholera. *Smith*: Below average in number, but above in quality and weight. *Tipton*: Greater number than for years, and the condition very

fine. *Bedford*: Diminished 50 per cent. by cholera, but the living are in fine condition. *Blount*: Rather scarce and small. *Gibson*: More abundant than for several years; condition favorable, though some complaint of cholera. *Perry*: Will be a large increase in the amount of pork put up this year.

WEST VIRGINIA.—*Greenbrier*: An increase on last year's stock. Many of the farmers now make their pork from spring pigs. A heavy mast-crop will more than make up for the deficiency in the corn-crop.

KENTUCKY.—*Garrard*: Dying rapidly of cholera in localities. *Shelby*: A falling off in numbers and weight, owing to the fattening of large numbers last spring, caused by high prices and a surplus of corn. *Marion*: Finest crop of oak-mast ever known, but hogs very scarce, and many dying of cholera. *Calloway*: Stock-hogs and pork abundant. *Boyle*: Much lighter in weight than usual. Many spring pigs will be fed for market. *Mason*: Will be light, owing to the fact that the older and larger were fattened and killed in the summer. Some cholera. *Spencer*: Small crop, many having died of cholera, so called. Those for feeding are young and small, but the heavy corn-crop will bring them on. *Gallatin*: Short in numbers but above average in size and condition. *Owsley*: Best mast ever known, but no hogs to eat it. *Livingston*: Will get fat on the remarkably fine mast.

OHIO.—*Ross*: Cholera doing some damage. *Franklin*: Reduced 10 per cent. by the prevalence of hog-cholera last fall and winter. Have a little of it now; one farmer has lost 119. *Delaware*: The number in the county last year, 18,784; this year, 20,245, and 10 per cent. larger and better. *Warren*: Cholera sweeping off shotes and ravaging fattening hogs. *Henry*: Many dying of cholera or some fatal disease; many losing whole herds; others, fearing the disease, have sold off all their stock-hogs. *Greene*: In some parts the hog disease has made sad havoc, taking in a few instances the entire herd, and, in many, 50 per cent. and upward.

MICHIGAN.—*Delta*: Few raised, but the number rather on the increase.

INDIANA.—*Decatur*: Stock-hogs scarce and dying of cholera. *De Kalb*: Disease is sweeping off hogs by the hundred, and no remedy is yet found. *Cass*: Some are dying of cholera. *Franklin*: Numerous; some dying with cholera, so called. *Hamilton*: Most of the hogs for feeding are spring pigs; some cholera, but not yet half as bad as last year. *Shelby*: Short crop, owing to cholera. *Marion*: Stock-hogs scarce; much complaint of cholera.

ILLINOIS.—*Hardin*: In splendid condition. *Jackson*: Cholera is killing what few we have left from last fall. It kills about 98 per cent. wherever it goes; turkeys and chickens are dying with it. *Madison*: Very scarce. *Marshall*: Plenty; cholera in some localities. *Mercer*: Dying badly in some parts of the disease known as cholera. *White*: Few were kept over, and 66 per cent. of them have died of cholera.

WISCONSIN.—*Crawford*: Not so large a stock of fattening hogs as last year. *Richland*: Very thin, owing to a short corn-crop last year.

MINNESOTA.—*Redwood*: Numerous and in good condition, but no feed with which to fatten.

IOWA.—*Crawford*: Many have died of a disease similar to cholera. *Hardin*: A little short and thin, owing to the late corn-crop last year. *Jefferson*: Owing to the short corn-crop, large numbers of stock-hogs have been sold and shipped West. *Washington*: Hog-cholera beginning to rage; some have lost their entire stock. *O'Brien*: Are being rapidly sent out of the county since the destruction of our crops by the grass-hoppers.

MISSOURI.—*Clay*: Dying from various diseases, but more plentiful than last year. *Cass*: The disease among hogs is making havoc wherever it strikes them, but is confined to localities. *Harrison*: Some cholera. *Nodaway*: Short crop, owing, in part, to cholera, but mainly to a short corn-crop last year. *Crawford*: Dying of cholera. *Henry*: Cholera, so called, has destroyed 40 per cent. of the stock-hogs; those that have recovered are doing well. *Pettis*: Will lose 20 per cent. by cholera and lung disease; hundreds are dying weekly; some farmers have lost as high as 60 in one day and night. *Caldwell*: In fine condition. *Cole*: Still dying. *Holt*: At least 20 per cent. more dying this year than last. *Randolph*: Cholera is raging fearfully in some parts; hogs are very scarce and high. *Ripley*: Died of cholera badly last year; hence, this year they are more in number and less in weight than last.

KANSAS.—*Jackson*: Scarce, but very good in size.

NEBRASKA.—*Antelope*: Three-fourths are pigs three to six months old; have old corn enough to put all into market in good shape.

FRUIT.

The hot and very dry August throughout the North and in some sections of the South occasioned extensive injury to the fruit-crop by causing premature cessation of growth and falling off. The disease described as pear-blight, twig-blight, fire-blight, &c., appears to be ex-

tending. It has reduced the pear-crop largely, and to some extent the apple-crop. In some sections it is destroying not merely the fruit but the trees. The report from Pulaski, Illinois, states: "The root-rot and fire-blight, so-called, continue to destroy our apple and pear trees to such an extent as to render orcharding a failure in all this south end of the State." Pear-trees have suffered much from "fire-blight" in Onondaga, New York; fruit-trees from "twig-blight" in Cumberland, New Jersey; and from "blight" in Randolph and Polk, Georgia, and Saint Clair, Alabama. In the county last-named many trees have been killed by the disease. The fruit-crop has been seriously curtailed in Minnesota and Nebraska, and somewhat in Iowa, by the ravages of grasshoppers. In Nebraska, Dodge County, they not only stripped fruit-trees of their leaves, but, in some localities, of their bark; in Boone they killed the young fruit-trees, and in Adams injured them 50 per cent. With these exceptions, returns, referring not to specific fruits noticed below, but to the general crop, including all kinds, are for the most part favorable. Among the localities reporting a great abundance of all kinds are Lancaster, York, and Mifflin, Pennsylvania; Carroll, Virginia; Hayne, Michigan; Clark, Wisconsin; and San Joaquin, California.

APPLES.—*Condition*: The returns from the several States for the condition of apples, September 1, give promise that, on the whole, a plentiful crop, of excellent quality, will be gathered. A few drawbacks are reported, but none of them serious, and most of them quite limited in extent. In the section north of the Potomac and east of Ohio, the large crop is being quite generally sifted by premature falling off, owing to the very dry August. Injuries by worms are noted only in Allegany, New York; Westmoreland, Virginia; and Beuton, Arkansas. In Fannin, Georgia, a large crop is being ruined by a "kind of fungus" on the twigs, which causes the leaves to die and fall off, and the fruit to be specked with "bitter-rot" and fall prematurely. "Bitter-rot" is also reported in Marion, Indiana, and Hamilton, Illinois. In Box Elder and Tooele, Utah, the crop has been greatly injured by the coddling-moth. With these exceptions the figures denoting reduced condition, generally indicate the percentage below average quantity on the trees, rather than injuries or defects in quality. The returns frequently, for obvious reasons, couple diminished numbers and superior size and quality together. In Dunn, Wisconsin, where the apples grown are of the crab varieties, the branches of the young trees are so burdened as to require artificial support to prevent breaking down. In Hall, Nebraska, the grasshoppers devoured one-third of the crop, yet the State averages 104. In the section above indicated as affected by drought, owing in part to causes previously reported, the condition differs widely in contiguous States. While in New Hampshire it rises to 112, it falls on the one side, in Maine, to 74, and on the other, in Vermont, to 71. Connecticut returns an average of 111, but Massachusetts 93, and New York 92. In New Jersey it rises to 103, and in Pennsylvania and Maryland to 106. In all the States south of the Potomac and the Ohio the figures fall considerably below average. Not including Louisiana, (51,) in which but few apples are grown, the range is between 62 and 91, Virginia and West Virginia being at the latter figure. Except Illinois, 88, a heavy crop is reported in the entire section bounded by the Ohio, the Missouri, and the Lakes; Ohio, 105; Michigan, 111; Wisconsin, 122; Minnesota, 106; Iowa, 121. In the remaining States west of the Mississippi the range is between 70 in Arkansas and 97 in Kansas, Missouri being 74.

MAINE.—*Waldo*: Scarce and small. *Cumberland*: Injured by drought.

VERMONT.—*Orleans*: Not enough for home use.

MASSACHUSETTS.—*Plymouth*: Very abundant, but dropping freely, owing to drought. *NEW YORK*.—*Montgomery*: Inferior in quality, owing to drought. *Saratoga*: Very abundant and of fine flavor. *Westchester*: Were very plenty, but are dropping off for want of rain. *Genesee*: Will be fine unless prematurely ripened by the prevailing dry weather. *Onondaga*: Young apple-trees have suffered much by "fire-blight." *Orange*: Dropping off prematurely; drought. *Sullivan*: Promise well. *Allegany*: Have never seen apples in this county wormy until this year. *Columbia*: Injured by drought.

NEW JERSEY.—*Cumberland*: Trees have suffered from twig-blight; apples are dropping off badly. *Burlington*: Falling badly. The market has been overstocked with summer varieties, causing low prices. *Mercer*: Very large product, but dropping off from drought. *Wyoming*: A fair crop, but dropping off from dry weather. *Warren*: Excellent crop in size and quality.

PENNSYLVANIA.—*Northumberland*: Very fair promise, but the severe drought is causing all varieties to fall off prematurely. *Westmoreland*: Much injured by worms. *Blair*: A large crop of exceeding fine quality. *Butler*: Plenty, but small. *McKean*: Poor, owing to drought and east winds. *Beaver*: Very plenty and good. *Bedford*: Very abundant. *Lancaster*: Falling off fast; poor prospect for winter-apples. *Warren*: The crop greatly reduced by protracted drought. *Berks*: Very plenty and cheap. *Lawrence*: Dropping prematurely in great quantities. *Lehigh*: The drought causes them to drop too early. *Washington*: A most bountiful crop; large and smooth. *Potter*: Late and small.

MARYLAND.—*Frederick*: Very abundant. *Baltimore*: Abundant, but some varieties dropping off. *Howard*: Fine crop.

VIRGINIA.—*Dinwiddie*: Hang well on the trees, and are maturing well. *King George*: A sufficient crop. *Madison*: Very heavy crop along the base of the Blue Ridge.

NORTH CAROLINA.—*Beaufort*: Large crop of superior quality. *Transylvania*: A light crop. *Onslow*: Late apples are doing well. *Hertford*: Abundant.

SOUTH CAROLINA.—*Clarendon*: A heavy crop. *Lexington*: Larger and better crop than for twenty years.

GEORGIA.—*Fannin*: Large crop, but of inferior quality. Owing to a kind of fungus on the twigs, the leaves are dying and falling from the trees, and the fruit is specked with bitter rot, and falling prematurely. *Jefferson*: A light crop.

ALABAMA.—*St. Clair*: The blight has killed many trees. *Morgan*: Abundant, but rotting.

ARKANSAS.—*Johnson*: Rotting and falling off. *Benton*: Greatly affected by worms, causing the fruit to fall off.

TENNESSEE.—*Bedford*: Superabundant; in many orchards the trees are breaking under the weight of fruit. *Wilson*: Below average in quantity, but the fruit unusually large. *Putnam*: Very fine.

WEST VIRGINIA.—Falling from the trees more than usual. *Wetzel*: Never more abundant or perfect.

KENTUCKY.—*Nicholas*: A fine and heavy crop. *Lincoln*: A little over half a crop—fair in quality. *Owsley*: Plenty, but injured by the drought.

OHIO.—*Clark*: Plenty. *Washington*: Light crop, but very plump and fair. *Preble*: Never more perfect and free from worms. *Hamilton*: Very plenty, and remarkably fair. *Delaware*: Fair fruit, but only half a crop. *Sandusky*: Very poor. *Warren*: In great abundance. *Huron*: In the northern part very plenty and nice; in the southern a failure. *Wood*: Abundant, and nice in size and quality.

MICHIGAN.—*Oakland*: The heaviest crop ever known, and shows the least effects of worms of any for ten years. *Lapeer*: A very large yield of good quality.

INDIANA.—*Ohio*: Finest crop ever known. *Franklin*: Abundant and fine; best crop in fifteen years. *Ripley*: Enormous crop; half must go for loss for want of demand or use. *Shelby*: A large crop, but falling off badly. *Whitley*: A fine crop and of good quality. *Floyd*: immense crop, selling at the distilleries at 35 cents per barrel. *Marion*: A good crop, but some complaint of bitter-rot.

ILLINOIS.—*Bureau*: More than last year, but many are scabby and gnarley. *Hamilton*: Affected with bitter-rot and falling off prematurely.

WISCONSIN.—*Dunn*: Our apples are of the crab variety, and the young trees so loaded that the branches need propping. *Brown*: The fruit in good condition, but not more than 25 per cent. of the trees that bore in 1873 are living. *Columbia*: A good crop.

MINNESOTA.—*Winona*: Trees nearly all blighted, but bearing well this year.

IOWA.—*Benton*: Double crop. *Washington*: Heavy crop.

MISSOURI.—*Clay*: Very large, owing to the small number on the trees. *Lafayette*: The few left falling off badly. *Mississippi*: Falling off badly. *Perry*: Half a crop. *Platte*: A hurricane, August 19, left scarcely an apple on the trees. *Caldwell*: Deficient in quantity; excellent in quality.

KANSAS.—*Jackson*: Good. *Nemaha*: Very fine, perfect.

NEBRASKA.—*Otoe*: Good yield. *Hall*: About one-third eaten by the grasshoppers.

OREGON.—*Grant*: Largely in excess of anything before known. *Linn*: Not more than 33 per cent. of a crop, but good in quality.

UTAH.—*Salt Lake*: The crop totally destroyed by the coddling-moth. *Box Elder*: Cut very short by the coddling-moth. *Tooele*: Plentiful but worthless, on account of the coddling-moth.

PEACHES.—*Product*: Iowa returns the product at 122; Oregon, 153; Michigan, 91; California, 90; Nebraska, 72; Maryland, 58; all of her states in which the crop is of any account report much below that figure—ranging down to 6 in Arkansas. The causes of reduction have been given in previous reports.

NEW JERSEY.—*Warren*: Abundant, but rather poor in quality owing to drought.

PENNSYLVANIA.—*Lehigh*: Do not attain full size; drought.

MARYLAND.—*Frederick*: Early varieties a failure, and late rotting on the trees. *Baltimore*: Rather inferior.

VIRGINIA.—*King and Queen*: On trees raised from the stone, a very luxuriant crop; but not a peach on grafts.

NORTH CAROLINA.—*Beaufort*: Not a full crop but very superior in quality. *Hertford*: The crop beyond the most extravagant expectations.

ALABAMA.—*Morgan*: More abundant and better quality than for years.

LOUISIANA.—*Franklin*: Rotted or fell off before ripening.

TEXAS.—*Lavaca*: A continuous shedding of the fruit. *Medina*: We had no fruit whatever from any grafted tree, they being more sensitive to the cold than seedlings.

ILLINOIS.—*Madison*: Rotting on the trees.

OREGON.—*Grant*: Largely in excess of any previous crop.

GRAPES.—*Condition*: The only States in which full condition is reported are Vermont, 100, and Oregon, 102, in both of which comparatively few grapes are grown. Extensive injuries to the vines by untimely frosts in the spring, and other causes preventing or diminishing young fruit, have been reported up to July. Since that date, as may be seen from notes below, by far the most extensive source of reduction has been rot. In Clarendon, South Carolina, while other varieties have been affected with rot, the scuppernong is better in quality than last year, though somewhat diminished in yield. But in Georgia, Bath, the scuppernong, for the first time in many years, "failed to be good." In Fanin, "grapes well cared for are unusually large and fine; those left to chance are nearly all destroyed by rot and insects." Washington, Arkansas, reports "a plenty of wild grapes on every hill-side, and as good in quality as the cultivated." Redwood, Minnesota, "a good yield of wild grapes of excellent quality," and Nemaha, Kansas, "hundreds of bushels of wild grapes of good quality." The crop has been injured by "fleas" in Grundy, Tennessee, and very "much injured by an insect supposed to be the *Phylloxera*" in Grant, West Virginia. In Athens, Ohio, some vineyards have lost all from the combined attacks of wasps, grasshoppers, and rot.

Upon the whole, notwithstanding the wide complaints of rotting, and some other local drawbacks, there is a prospect of a crop not very much below average. Michigan and Iowa return a condition of 99; Minnesota, Kansas, Nebraska, and California, 98; Massachusetts, Wisconsin, and Connecticut, 97; Pennsylvania, 95; New York, 92.

NEW YORK.—*Onondaga*: Have done very well. *Wyoming*: Coming forward well.

PENNSYLVANIA.—*Westmoreland*: Abundant, but not ripening well. *Lehigh*: Do not attain full size; drought.

MARYLAND.—*Frederick*: Good.

VIRGINIA.—*Dinwiddie*: A favorable season for the crop; no rot nor blight. *King George*: Mature badly.

NORTH CAROLINA.—*Alamance*: Some have rotted. *Orange*: Some are rotting.

GEORGIA.—*Fulton*: Vineyards increasing, with good prospects for fine returns. *Richmond*: Very fine crop. *Upson*: Good.

FLORIDA.—*Jackson*: A good crop now on hand; wine-making in progress.

LOUISIANA.—*Jackson*: A very good crop.

TEXAS.—*Coryell*: A full crop, and very fine in quality. *Bandera*: Damaged 50 per cent. by drought.

ARKANSAS.—*Johnson*: Rotting and falling off.

TENNESSEE.—*Gibson* : Doing well, but some complaint of rotting. *Greene* : Rotting badly. *Putnam* : Rotted badly.

WEST VIRGINIA.—*Wetzel* : Three-fourths of a splendid crop have rotted.

OHIO.—*Clark* : Plenty. *Hocking* : Rotting and falling off. *Washington* : Rotting badly. *Ross* : Rotting badly. *Preble* : Reduced some by rot. *Wayne* : Much injured by rot. *Athens* : Have rotted badly; some vineyards have lost all by wasps, grasshoppers, and rot. *Warren* : Rotting somewhat.

MICHIGAN.—*Lapeer* : Clusters not well filled out. *Calhoun* : Suffered from mildew and rot.

INDIANA.—*Marion* : A large crop, but they have rotted badly.

ILLINOIS.—*Madison* : Mostly destroyed by rot, especially the Concord. *Perry* : Rotting. *Shelby* : Have suffered from excessive wet and heat. *Warren* : Rotted badly. *Clark* : Rotted badly.

MISSOURI.—*Buchanan* : Rotting. *Crawford* : Have nearly all rotted. *Perry* : Nearly all have rotted. *Ralls* : Damaged by rains. *Shelby* : About 50 per cent. rotted. *Butler* : Not over half a crop; blasted by the continuous rains of May and June. *Cape Girardeau* : Grew in abundance, but nearly all rotted before maturing. *Ripley* : Rotted.

KANSAS.—*Jackson* : Good. *Nemaha* : Hundreds of bushels of wild grapes of good quality are being gathered for wine and preserves. The cultivated grapes are very good.

NEBRASKA.—*Otoe* : Grand yield.

OREGON.—*Clackamas* : Heavy in quantity, but late in maturing.

BEANS.

The average condition of the entire crop falls somewhat below 100. Grasshoppers, in the section visited by them, evinced a special appetite for this crop, and in localities they completely devoured it. The reduced condition for the most part indicates shrinkage in yield, and to some extent, in mature plumpness of the bean, occasioned by drought, or by grasshoppers, rather than injuries to the quality by frosts or by rains, between ripening and curing. The only States reporting an average condition above 100 are Vermont and Mississippi, 104. The condition averages 100 in New Jersey, Maryland, Arkansas, Kentucky, and Oregon. It falls in Maine to 91; Massachusetts, 87; Connecticut, 63; New York, 88; Minnesota, 64; Iowa, 75; Nebraska, 61. In the remaining States the range is between 92 and 99.

MAINE.—*Franklin* : Injured by drought. *Piscataquis* : Not well filled; drought.

VERMONT.—*Orleans* : Nicely cured.

NEW YORK.—*Wyoming* : Good condition, but not a large yield.

PENNSYLVANIA.—*Warren* : Greatly reduced by drought.

GEORGIA.—*Baldwin* : Suffering from drought. *Upson* : Very fine.

TEXAS.—*Medina* : Injured by protracted drought. *Bexar* : Rained by drought.

TENNESSEE.—*Monroe* : Good crop.

ILLINOIS.—*Lake* : Drowned out.

MINNESOTA.—*Redwood* : Badly damaged by grasshoppers. *Faribault* : Nearly destroyed by grasshoppers. *Meeker* : Nearly all destroyed by the grasshoppers. *Blue Earth* : Ruined by grasshoppers. *Rock* : Entire failure from grasshoppers.

IOWA.—*Humboldt* : Nearly ruined by grasshoppers.

KANSAS.—*Burton* : Destroyed by grasshoppers.

NEBRASKA.—*Knoc* : Destroyed by grasshoppers. *Cuming* : Injured by grasshoppers. *Saunder* : Rained by grasshoppers. *Antelope* : Taken clean by grasshoppers.

HOPS.

Acreage.—There has been, on the whole, a slight increase in acreage. While a decrease is indicated of 2 per cent. in Wisconsin, 5 in Ohio, and 1 in West Virginia, the increase amounts to about 5 per cent. in New York and Oregon, 8 in Michigan, and 2 in Iowa. The acreage remains unchanged in California.

Condition.—The condition is not up to average in respect to promised yield; poor quality is specified in only one return, that from Madison, New York, while that from Franklin specifies small yield but good

quality. The only cause of reduction named is drought, except that in Dodge County, Nebraska, grasshoppers destroyed the entire crop. The condition of 16 counties in New York, returning hops, averages 87; 23 in Wisconsin, 82; 9 in California, 97; 7 in West Virginia, 10 in Ohio, 10 in Michigan, and 5 in Missouri, 99; 5 in Vermont, 81; 5 in Pennsylvania, 95; 5 in Indiana, 106; 8 in Iowa and 5 in Oregon, 101.

VERMONT.—*Orleans*: Small but good in quality.

NEW YORK.—*Schoharie*: Increase in acreage, but condition below average. *Onondaga*: Will be fair; prices 25 to 30 cents. *Franklin*: Entirely a top crop. *Madison*: Not over 67 per cent. of a crop; light in weight and weak in strength, owing to drought.

WISCONSIN.—*Juneau*: Will not be more than one-third of last year's crop. *Richland*: A light crop; being picked. *Sauk*: Last year 2,500 acres; this year, 2,935; the average yield about 350 pounds of cured hops to the acre. About half are picked.

CALIFORNIA.—*San Joaquin*: Considerable attention is being paid to hops.

OREGON.—*Clackamas*: Increase in acreage and yield.

THE HAY CROP.

CLOVER.—*Condition*: The August returns reported that clover was generally harvested in superior condition in New England, in the entire section south of the Potomac, the Ohio, and the Missouri, and on the Pacific Slope. In the remaining section the crop was more or less damaged by wet weather, partly by preventing seasonable cutting, and partly by injuries between cutting and curing. The damage was greatest in the States bordering the Ohio on the north. Ohio returned an average condition of 94; Indiana, 86; Illinois, 92.

Product: The product equaled that of last year in Massachusetts and Connecticut; was less in New Hampshire by 11 per cent.; Vermont, 21; Rhode Island, 4; North Carolina, 3; Mississippi, 5; Wisconsin and Minnesota, 10. In the remaining States it exceeded that of last year; in Maine, New Jersey, and Maryland by 4 per cent.; Missouri and Nebraska, 6; Delaware and Georgia, 7; Alabama and Arkansas, 9; West Virginia, 10; Illinois, 11; Ohio and California, 12; Kansas, 15; Michigan, 16; Texas and Tennessee, 18; Kentucky, 21.

TIMOTHY.—*Condition*: The August returns indicated an average condition considerably above 100. The only States in which it fell below were, Massachusetts, 91; Rhode Island, 82; Connecticut, 90; New York, 99; New Jersey, 87; Delaware, 98; and Minnesota, 86. In the last named, grasshoppers, with dry weather, were the main causes assigned for reduction; in the others dry weather alone. Among those reporting the highest condition were Maine, Pennsylvania, Wisconsin, Iowa, and Nebraska, 105; Arkansas, Tennessee, West Virginia, and Indiana, 107; Illinois, 108; Texas, 109; California, 111; Michigan, 112. Returns for September indicate that timothy was generally harvested in excellent condition. The States in which it falls below average are, Massachusetts, 99; New Jersey, North Carolina, and California, 98, and Minnesota 93. In Connecticut and Arkansas it is average; in all the other States better than that, ranging from 101 to 112.

Product: The product of timothy is reported equal to that of last year in Maine, Vermont, and Alabama; less than last year in New Hampshire and Connecticut, 98, and Minnesota, 92; greater than last year in all the remaining States. New York and Texas return an increase of 3 per cent; New Jersey and West Virginia, 19; Pennsylvania, Kentucky, Indiana, and Illinois, 15; Maryland, 11; Virginia, Iowa, and Oregon, 10; South Carolina and Arkansas, 12; Tennessee, 9; Ohio, 13; Michigan, 22; Wisconsin, 8; Missouri, 7; Kansas, 16; Nebraska, 25; California, 6.

ALL KINDS.—*Condition and product* : The report by figures for August 1 was limited to clover and timothy, but our correspondents, in abundant notes respecting the entire crop, as made up of cultivated and indigenous grasses and forage products of all kinds, foreshadowed a generous hay-crop, above average in intrinsic quality and much the larger portion of it secured in superior condition. The principal exception to a general good condition when harvested was in the section north of the Ohio and Missouri, where excessive rains, especially in Ohio, Indiana, Illinois, and Iowa during the proper season for harvesting considerably damaged the heavy crops. A few of the local returns for August are worthy of special notice. Aroostook, Piscataquis, and York, in Maine, report that abundant crops had been secured in the best condition. In Pennsylvania, Indiana County produced more hay "than for the last ten years put together, housed in fine condition"; Elk the best crop in fifteen, and Tioga the best in twenty years, also well secured. The report from Dallas, Arkansas, stated that two crops of alfalfa had been secured and a third was growing, adding the opinion that that is "the only grass for this section." Arkansas County reported that more than two-thirds of the farmers were raising very promising crops of millet, and several other returns from Arkansas noticed the success and growing popularity of this crop. Several returns from Tennessee also indicated that the growing of millet had proved quite successful and that its culture is extending.

From West Virginia and Kentucky, and from Missouri, except Saint Charles and Moniteau, reports were uniformly favorable respecting the quantity of the crop and the condition in which it was secured. In California, Fresno reported a very large crop consisting of alfalfa and "wheat and barley hay;" Lake, that the crop of "grain-hay" was 50 per cent. above average; and Santa Clara, that three times the usual amount of hay had been secured.

The September returns report the product of all kinds of hay compared with last year. The only States which return less are New Hampshire, Vermont, Massachusetts, and Kansas, 98; Florida, 94; Louisiana, 96; Minnesota and Nebraska, 97. In the last two and Kansas, grasshoppers were the chief cause of reduction. In all the remaining States the product is greater than last year, the range of excess being from 3 to 34 per cent. Among the States producing a million tons and upwards the figures for comparative product are, in Maine and New York, 105; Pennsylvania and Ohio, 116; Illinois, 118; Michigan, 122; Wisconsin, 131; Iowa, 112; Indiana, 115. Among other States indicating a large comparative increase are, New Jersey, 113; Maryland and Georgia, 111; Virginia, 114; Alabama and Texas, 107; Arkansas, 117; Missouri, 105; Tennessee, 121; West Virginia, 124; Kentucky, 134; California, 125; Oregon, 115.

The extracts below from the September returns give various local details respecting quantity, quality, condition when harvested, and the causes affecting each.

MAINE.—*Piscataquis* : Harvested in the best condition for years. *Waldo* : Better than for many years.

NEW HAMPSHIRE.—*Cheshire* : A good crop.

VERMONT.—*Orleans* : Well secured.

NEW YORK.—*Saratoga* : Well secured. *Madison* : A good crop gathered, in fine condition. *Wyoming* : Good in quality. *Sullivan* : Not an average crop, but much superior to last year.

NEW JERSEY.—*Cumberland* : The heaviest crop for several years. *Sussex* : Though not a full crop, better and more plentiful than last year by 25 per cent. *Warren* : Well secured.

PENNSYLVANIA.—*Cambria*: Well secured. *Beaver*: Put up in good order. *Eli*: An enormous crop, harvested in good condition. *Indiana*: An immense crop, all well secured. *Sullivan*: Never more abundant.

MARYLAND.—*Baltimore*: A large crop and all kinds secured in fine condition. *Howard*: One of the best crops for years.

VIRGINIA.—*Campbell*: Excellent crop in yield and quality. *Middlesex*: Very fine crop. *Dinwiddie*: A good crop, and was harvested in better condition than I ever saw before. *Madison*: Very heavy crop; better than for many years. *Rockingham*: Fine crop in quantity and quality. *Russell*: A good crop, in good condition. *Carroll*: Very good crop. *Orange*: Shortened by a protracted drought. *Prince George*: Diminished by drought in May and June.

NORTH CAROLINA.—*Orange*: The crop of late grass is unprecedented. *Buncombe*: First-rate.

SOUTH CAROLINA.—*Newberry*: German millet yields an abundance of excellent hay. *Greenville*: Largely damaged by heavy rains.

GEORGIA.—*Catoosa*: Quality not so good, owing to showery weather; but the quantity 15 per cent. above, owing to German millet. *Elbert*: Fine season for hay. *Thomas*: Better crop than last year. *Upson*: Very fine. *Jefferson*: Very good crop. *Twiggs*: The fodder has been saved in better condition than for years.

FLORIDA.—*Gadsden*: Corn-fodder has been saved in good condition, and the crops of green pease, ground pease, and chufus promise a good yield.

ALABAMA.—*Conecuh*: As good a crop as the land can bring.

TEXAS.—*Harris*: The prairie-grass is fine, and the weather for cutting perfect. *Titus*: Never better. *Austin*: A very heavy crop. *Collin*: Prairie-hay better than for years. *Medina*: Reduced by protracted drought.

ARKANSAS.—*Arkansas*: A big crop. *Izard*: German millet almost the only kind of hay raised; was damaged in making. *Fulton*: Good; German millet extra good.

TENNESSEE.—*Blount*: Extra crop. *Greene*: German millet and all other kinds above average. *Wilson*: Large crop; more and better clover-hay saved than any previous year. *Fentress*: Enormous crop. Millet is rapidly coming into use. *Bledsoe*: Good yield of millet; hay of excellent quality.

WEST VIRGINIA.—*Grant*: Somewhat injured by rains. *Brarton*: Best crop in quantity and quality for years. *Hardy*: Extra large crop. *Mercer*: The quality above average. *Jefferson*: Better than last year. A fine crop of Hungarian and fox-tail grasses.

KENTUCKY.—*Calloway*: The best crop of all kinds ever raised. *Boyle*: Far above a general average, with fine harvest-weather. *Henry*: Unusual fall rains interfere with the saving of the millet and Hungarian crops. *Lincoln*: One of the heaviest crops in ten years. *Logan*: Saved in fine condition; selling at \$6 to \$8 per ton.

OHIO.—*Ross*: Timothy too ripe before cutting; too much rain. *Preble*: The product of all kinds fully 15 per cent. above last year. *Geauga*: The heaviest crop for twenty years. *Sandusky*: All kinds never better; worth only \$5 per ton. *Portage*: Considerably increased by second crop, the cutting of which is unusual here. *Wood*: Unusually large crop, but not good in quality.

MICHIGAN.—*Mason*: Fine. *Oakland*: The heaviest crop ever harvested—the timothy in first-rate condition; clover injured somewhat. *Menominee*: Large crop, well secured. *Alpena*: Better than ever before; will average more than two tons per acre. *Delta*: A heavy crop, well saved; the price the lowest ever known. *Lapeer*: Good in quality and well secured. *Lenauee*: Clover-hay much injured by wet weather. *Calhoun*: Injured by rains. *Kent*: Unusually heavy crop.

INDIANA.—*Decatur*: Good crop secured in excellent condition. *De Kalb*: Clover-hay badly injured. *Franklin*: A large crop well harvested. *Washington*: All well saved. *Floyd*: Sold last year for \$16 per ton; selling now for \$7.

ILLINOIS.—*Jefferson*: The product beyond all precedent. *Hamilton*: Clover injured in harvest but other hay fine. *Ogle*: Good. *Pope*: Large amount of clover not saved, owing to wet.

WISCONSIN.—*Waukesha*: The best second crop ever known. *Columbia*: Good. *Crawford*: The largest yield of all kinds for years, all well saved. *Walworth*: A first-rate crop of cultivated grasses, well secured; wild hay damaged by excessive rains.

MINNESOTA.—*Isanti*: A large reduction by the drought in July.

IOWA.—*Wayne*: Never better. *Jones*: Timothy and clover extra good; much wild grass on low lands spoiled by overflow in July. *Tama*: Damaged 25 per cent. by the flood of July 5th.

MISSOURI.—*Chariton*: Good crop, well saved. *Clay*: Good. *Nodaway*: Very large crop, well secured. *Mississippi*: Saved in good condition; yield of German millet estimated at 4 tons to the acre. *Ralls*: Saved in fine condition. *Caldwell*: More cultivated and less prairie-hay than last year. *Macon*: Fine. *Ripley*: More made than ever before; farmers giving much more attention to grass.

KANSAS.—*Jackson*: Largest yield of timothy ever harvested. *Nemaha*: Splendid crop. *Woodson*: A vast surplus of excellent quality will be put up.

NEBRASKA.—*Antelope*: Large harvest of excellent prairie-hay.

OREGON.—*Douglas*: Extra yield of timothy.

PASTURES.

Upon the whole the high condition of pastures reported for June was maintained up to the 1st of August. The condition had been reduced in Rhode Island to 45, and in New Jersey to 56, by severe drought. Owing to local droughts chiefly, it was somewhat below 100 in Massachusetts and Connecticut, in the coast States between Pennsylvania and South Carolina, and in Mississippi and Louisiana. Grasshoppers with dry weather had reduced it to 93 in Minnesota. But in Vermont the condition had risen to from 90 to 104; in Florida from 97 to 100; in Kentucky from 97 to 107; and in all the remaining States it was above 100, many of them showing a decided advance on the June returns. Among the highest were Iowa and Kansas, 106; Maine, 108; Ohio, and California, 109; Missouri, 111; Michigan, 113; Texas, 114; Arkansas and Illinois, 115; Tennessee and Oregon, 116. Several returns from Texas referred to the thrifty, fat condition of stock, consequent upon the abundant and excellent pasturage. In California the wet winter and late spring rains had contributed to make pasturage unsurpassed.

The condition of pastures is not specifically reported in the September returns; but our reporters, in notes from which brief extracts are given below, indicate severe reductions in August, from excessively hot and dry weather throughout the eastern, middle, and lake States, and Texas, and from grasshoppers in Minnesota, Kansas, and Nebraska. Little or no depreciation and in some localities an advance in high condition is indicated in the interior, and on the Pacific slope.

MAINE.—*York*: Whitening from drought. *Penobscot*: Short from dry weather. *Oxford*: Injured by a severe drought for the last six weeks. *Cumberland*: Much dried up; cattle being fed from the barn.

NEW HAMPSHIRE.—*Carroll*: Very little feed left, and cattle falling away; drought.

VERMONT.—*Franklin*: Short; product of milk and butter diminishing; drought. *Lamoille*: Feed mostly dried up, and dairy products essentially reduced; stock have to be fed largely from the barn.

MASSACHUSETTS.—*Worcester*: Scorched by drought. *Hampden*: Dried up.

NEW YORK.—*Greene*: Burned up; farmers are feeding corn-fodder. *Otsego*: Drying up. *Westchester*: All dried up. *Chautauqua*: Injured by severe drought. *Onondaga*: Crisped by the terrible drought. *Steuben*: Short, from drought. *Franklin*: Completely dried up; farmers feeding their cattle. *Fulton*: Drying up. *Erie*: Dry and bare.

PENNSYLVANIA.—*Wayne*: Dried up; cows require daily feed. *Armstrong*: Suffered much during August for want of rain. *Beaver*: Good. *Susquehanna*: Dried up, and cattle suffering for food. *Washington*: In localities almost gone, owing to drought, grasshoppers, and grub-worms. *Wyoming*: None, owing to drought; have to feed cattle.

DELAWARE.—*Sussex*: Being parched.

MARYLAND.—*Montgomery*: Seriously injured by the driest August for many years.

VIRGINIA.—*Middlesex*: Excellent.

NORTH CAROLINA.—*Transylvania*: Have improved very much during August.

GEORGIA.—*Baldwin*: Suffering for rain.

ALABAMA.—*Jackson*: Never better. *Shelby*: Fine.

TEXAS.—*Bandera*: Have the appearance of ripe grain-fields from drought. *Uvalde*: Much dried up. *Bexar*: The grass on the prairies is dried up. Stock have to go from one to eight miles for water.

ARKANSAS.—*Arkansas*: Prairie as green as in June, and breast-high. *Independence*: Cattle fat. *Izard*: Range and inside pastures very fine; domestic animals healthy and fat.

TENNESSEE.—*Trousdale*: Good. *Bledsoe*: Very fine.

KENTUCKY.—*Cumberland*: Extra fine. *Jessamine*: Blue-grass pastures better than usual. *Mason*: Unusually fine. *Owsley*: Dried up.

OHIO.—*Wayne*: The earth here is carpeted with grass. *Harrison*: Grass abundant; plenty of rain. *Richland*: Never better. *Portage*: Abundant.

MICHIGAN.—*Kalamazoo*: Quite short from drought.

INDIANA.—*Lawrence*: Excellent; stock doing well. *Warren*: Good. *Floyd*: Never better.

ILLINOIS.—*Jefferson*: Keeping green beyond all precedent. *Piatt*: Very fine. *Ogle*: Good. *Morgan*: Heavy fall feed of grass and weeds.

WISCONSIN.—*Waukesha*: Good.

IOWA.—*Jones*: Extra good.

MISSOURI.—*Harrison*: Fine. *Putnam*: Abundant. *Cole*: Excellent.

CALIFORNIA.—*Calusa*: Very abundant, and all kinds of stock doing better than in any previous year.

SORGHUM.

Returns indicate that the extending culture of sorghum in the Gulf States is being encouraged by promising results. In the entire section south of the Potomac and the Ohio the only States reporting a condition not averaging above 100 are North Carolina, 98, and West Virginia, 99. Among the highest are South Carolina, Louisiana, and Tennessee, 104; Georgia, 105; Alabama and Kentucky, 106. In the Ohio Valley and west of the Mississippi the range is from 90 to 99.

VIRGINIA.—*Madison*: The largest crop ever grown. *Russell*: Very good.

GEORGIA.—*Troup*: Good. *Fulton*: More planted than ever before, and very fine. *Upson*: Very fine.

ALABAMA.—*Bullock*: Fine. *Conceh*: Prospect of a No. 1 crop. *Crenshaw*: Very good. *Lauderdale*: Good, and becoming a very important crop in this county.

MISSISSIPPI.—*Choctaw*: Much better than last year. *Perry*: Planted for the first time and successful. *Lincoln*: Favorable as could be desired.

TEXAS.—*Titus*: Better than for years. *Bustrop*: The yield has been as great as 120 gallons of sirup per acre; 80 gallons is the average. This promises to be a profitable industry here, and I think many will grow sorghum instead of cotton another year. *Upshur*: Doing well; enough to supply the county with sirup. *Austin*: Turning out 100 to 125 gallons of sirup per acre. *Waller*: Being tried by many farmers. *Rusk*: The sorghum-mills are all busy. *Medina*: Reduced by protracted drought.

ARKANSAS.—*Fulton*: Many crops damaged by black rust.

TENNESSEE.—*Monroe*: Abundant crop made. *Greene*: Heavy growth. *Wilson*: A full crop and a splendid yield.

ILLINOIS.—*Hardin*: Good. *Carroll*: Best of weather for ripening.

MISSOURI.—*Johnson*: The prospect for a crop grows less and less.

NEBRASKA.—*Saunders*: Largely ruined by grasshoppers.

RICE.

In the section where rice is grown occasional references to the crop by our correspondents indicate a promising condition. In Georgia the inland crop in Liberty County is promising, and in McIntosh, in which rice is a staple product, the promise is reported to be better than for the last ten or twelve years. Our reporter in Santa Rosa, Florida, also states that in that section, in which rice is a principal crop, a very fine and remunerative yield is promised.

SOUTH CAROLINA.—*Barnwell*: Shortened by drought in the western part of the county.

GEORGIA.—*McIntosh*: Rice is one of our principal crops; very fine yield; best for ten or twelve years. *Liberty*: Prospects of a good crop.

FLORIDA.—*Santa Rosa*: Rice our principal crop; it looks very well. *Marion*: Silver-hull from the Department a failure.

INSECT-INJURIES.

With the exception of the grasshopper raid west of the Mississippi and the cotton caterpillars in the South, the operations of the farmers' insect enemies have been on a comparatively small scale.

WHEAT-INSECTS.—Of insects especially infecting the wheat-crop, the Hessian fly (*Cecidomyia destructor*) is reported in Carroll, Maryland; Russell, Virginia; Carroll, Georgia; Lake Michigan; Fond du Lac and Wine-bago, Wisconsin; Jackson, Iowa; and Greenwood, Kansas. The midge,

(*Diplosis [cecidomyia] triticeis*,) sometimes improperly called the red weevil, did some damage in the spring-wheat in Grand Isle and Orleans, Vermont. It is also noted in Shiawassee, Michigan; Boone, Wisconsin; and DeKalb and Wabash, Indiana. In the last-named county half the wheat-crop was destroyed. Several new wheat-insects are reported. One in Blair, Pennsylvania, attacked the straw when the wheat was a few inches above ground. Another in Outagamie, Wisconsin, working at the root of the plant, caused the straw to fall down. A small white worm is noted as injurious in Grundy, Iowa, and a green worm in Saline, Kansas, injured winter-wheat. Unknown insects were also troublesome to wheat-growers in Waseca, Minnesota, and Hardin, Iowa.

THE COTTON-CATERPILLAR (*Anomis [Aletia] xylinæ*,) during July made some harmless incipient demonstrations, which unhappily were followed in August by severe injuries at numerous points in the cotton-belt. Its operations appear to have been confined mostly to the southern counties, as North Carolina and Tennessee report no injuries, and South Carolina and Arkansas in but one county each, and that not very serious. In Beaufort, South Carolina, a few were noted in sea-island cotton, growing on the mainland. Georgia reports them in four counties, all lying between the Chattahoochee and Flint Rivers, viz: Muscogee, Terrell, Harris, and Stewart; in the last named, the insect was noticed only in late plantings in fresh lowland soils. They were more or less injurious in Jackson, Columbus, and Jefferson, Florida, and in Marengo, Coffee, Clarke, Bullock, Lauderdale, Crenshaw, Monroe, Lowndes, and Hale, Alabama; in Dallas they destroyed 40 per cent., and in Greene 50 per cent. of the crop; in Conecuh they threatened to close it out entirely; in Perry they devoured rotten apples, cider-pumice, &c. Mississippi reports them in Rankin, Kemper, Adams, Lowndes, Covington, Jasper, Clarke, and Marion; Louisiana, in Caddo and Concordia; Texas, in Polk, Waller, Matagorda, Washington, Austin, Bastrop, Lavaca, Victoria, Colorado, and Marion; Arkansas in Nevada. The following letter from M. F. Hartman, secretary of the Agricultural Society of Austin County, Texas, gives a graphic view of these pests in that county, especially illustrating their enormous power of propagation:

As predicted in my last, the cotton-worm reached us last week, and devoured every particle that was eatable, leaves, blossoms, and small bolls. Never since my knowledge have these worms appeared in such a multitude. After having laid waste our fields, they thronged and blackened our lanes, roads, and highways; they penetrated lawns, yards, and even dwelling-houses, lying in the pathway, requiring the constant use of the broom to repel our loathsome guests. Hens, turkeys, and geese had a feast and grew fat. In this portion of our county the loss was not so severe, as the gathering had already begun and most of the bolls were fully grown, but the southern part, bordering on an extensive prairie that reaches to the Gulf of Mexico, two hundred miles distant, was attacked four weeks earlier, and the loss is a very severe one.

COTTON-LICE, (*Aphis*, sp.)—Minute bugs or lice, resembling rust clustering round the cotton-stalk and on the under side of the leaves, caused the plant to shed and turn yellow in Covington, Alabama; Red River, Panola, Wood, and Titus, Texas; and in Bell and Clarke, Arkansas. This insect does not appear to have wrought a very serious amount of injury on the whole.

CHINCH-BUGS (*Micropus [Rhyparochromus] leucopterus*) showed themselves during August on the Atlantic slope, having been noted at several points in the Mississippi valley during July. Davidson and Warren, North Carolina, were troubled by them. In the latter strong lye of wood-ashes applied to the corn-stalk disposed of the pests. It was found necessary, however, not to allow the lye to come in contact with the corn-bud, as it would probably destroy it. They were de-

destructive to wheat in Hunt, Texas. In Boone and Winnebago, Illinois, they ruined spring-wheat and barley and threatened the corn. In Dunn, Wisconsin, it was noticed that they did not touch the Odessa wheat when any other variety was growing near it. They were destructive to spring-wheat also in Washington, Brown, Columbia, Fond du Lac, Green, Monroe, Calumet, Grant, Jackson, Jefferson, Juneau, La Crosse, Portage, Pierce, Sauk, Vernon, Walworth, Waukesha, and Winnebago. In some cases, after destroying wheat, they attacked the corn, and where the grain was too hard for their consumption they stripped the blades. They are also reported in Jackson, Iowa; Atchison, Missouri; Nemaha, Neosho, El Dorado, Washington, and Smith, Kansas; and in Gage, Saunders, and Richardson, Nebraska.

BOLL-WORMS (*Heliothis armigera*) are reported in Lee, Mississippi, and in Nacogdoches, Smith, Hunt, Rusk, and Lamar, Texas.

GRASSHOPPERS.—Insects bearing this popular designation are reported in the Middle, Southern, and Northwestern States. In the latter case there is no difficulty in identifying them with the dreaded *Caloptenus spretus*, which, it is believed, confines its visitation to the regions west of the seventeenth meridian. An examination of the map shows that all the counties of Minnesota, Iowa, and Missouri reporting the ravages of this insect lie wholly or partly west of that meridian. In Minnesota they were more or less destructive in McLeod, Yellow Medicine, Faribault, Redwood, Meeker, Nicollet, Blue Earth, Nobles, Stevens, Stearns, Todd, Rock, Jackson, Pope, Renville, Chippewa, Swift, and Kandiyohi; in Iowa, in Crawford, Clay, Harrison, Calhoun, Humboldt, Cherokee, Sioux, Greene, Montgomery, Audubon, Guthrie, Pottawattamie, Pocahontas, and Sac; Missouri reports them only in Atchison. Kansas had a very severe visitation in some counties, viz: Mitchell, McPherson, Pawnee, Washington, Ellis, Reno, Norton, Graham, Rice, and Republic. Nebraska, however, received the brunt of the destructive invasion, reporting them in Furnas, Knox, Osage, Cuming, Dodge, Webster, Franklin, Saunders, Seward, Thayer, Boone, Lancaster, Platte, Hall, Wayne, Merriek, Antelope, and Richardson. A detailed summary of the injuries inflicted will be found in our "extracts from correspondence." The farmers of this region, especially those west of the Missouri, have suffered an incalculable disaster, and great suffering must be the result. Our correspondent in Osage, Nebraska, after carefully noting the incubation of these insects in a field of oat-stubble, estimates the average number of deposits at fifteen per square inch, each deposit averaging thirty eggs. This gives the frightful aggregate of 2,826,688,000 eggs per acre. This is doubtless a greatly exaggerated estimate, but after every deduction enough remains for serious alarm. It is not to be wondered at that some of our correspondents in this region call earnestly for the legal protection of insectivorous birds.

The *C. femur rubrum* did some damage in Westmoreland and Washington, Pennsylvania, to corn and grass crops. In Franklin, Virginia, and in Logan, Kentucky, they imitated one of the vices of civilization by chewing tobacco; in Callaway they nearly destroyed the turnip-crop. In Athens, Ohio, they devoured grapes. In Campbell, Tennessee, they were unusually abundant and destructive to corn.

In the Southern States an insect called the grasshopper, but which cannot be identified by any specific name from the description, is reported in several counties. Our correspondent in Carroll, Georgia, says:

Grasshoppers of a very distinctive kind have made their appearance here; some green, some yellow, some striped. They are of a kind never seen here before, and

great fears are felt on their account. Corn in some fields is already stripped of its blades, and cotton-fields of the leaves; they appear to be moving in a northwest direction.

This may be *Caloptenus differentialis*, a specimen of which has been received from Georgia. Grasshoppers of this or some other species unidentified destroyed various crops in Bartow, Fayette, Forsyth, and Floyd, Georgia, and in Etowah, Alabama.

COLORADO BEETLES, (*Doryphera decemlineata*.)—This pest has been far less injurious to the potato-crop than last year. In the West their visits were fortunately like angels' visits—few and far between. In the East they were quite generally diffused, but, except in New York, comparatively harmless. They are reported in Chautauqua, Delaware, Onandaga, Orange, Broome, Schuyler, Sullivan, and Suffolk, New York; Cumberland, New Jersey; Chester and Lehigh, Pennsylvania; Prince George's, Maryland; King and Queen and Richmond, Virginia; Perry, Ohio; Hayne, Michigan; Elkhart, Indiana; Johnson, Illinois; Brown, Wisconsin; Steele, Minnesota; Howard, Iowa; Antelope, Nebraska.

ARMY WORM, (*Leucania unifructa* [?])—This insect is reported in Linn, Oregon, as eating potato-vines and then destroying the tubers. An insect under this name, but not identified, injured corn in East Feliciana, Louisiana.

MISCELLANEOUS.—Grub-worms (*Lachnosterna*, sp.) injured pastures in Washington, Pennsylvania. In Spartanburgh, South Carolina, the cabbage-crop was destroyed by a green worm, (*Pieris rapæ* [?]) In Franklin, Virginia, tobacco was punctured in the stalk by a worm that devoured the pith, while in Logan, Kentucky, the flea-bugs (*Haltica* [?]) destroyed the plants. Wire-worms (*Elater*, sp.) injured corn in Lawrence, Indiana. A prolific insect called cut-worm, very different from the ordinary cut-worm, destroyed root-crops, vegetables, and fruit in Benton, Oregon. Several counties report new insects injuring corn. The leaf-hopper (*Erythroneura* [?]) injured grapes in Westmoreland, Pennsylvania, and in Grant, West Virginia, there is a panic about the dreaded *Phylloxera*.

Table showing the condition of the crops, &c., on the 1st day of September, 1876.

States.	CORN.		WHEAT.		RYE.		OATS.		BARLEY.		BUCK- WHEAT.		POTATOES, (<i>Solanum tuberosum</i>).		POTATOES, (<i>Batatas ed- ulis</i> , JSWET.		TOBACCO.		COTTON.		HAY.		
	Average condi- tion Septem- ber 1.	harvested.	Average condi- tion when harvested.	harvested.	Average condi- tion when harvested.	harvested.	Average condi- tion when harvested.	harvested.	Average condi- tion when harvested.	harvested.	Average condi- tion Septem- ber 1.	harvested.	Average condi- tion Septem- ber 1.	harvested.	Average condi- tion Septem- ber 1.	harvested.	Average condi- tion Septem- ber 1.	harvested.	Average condi- tion Septem- ber 1.	harvested.	Product of tim- ber com- pared with last year.	Average condi- tion of tim- ber when harvested.	Product of hay of all kinds with last year.
Maine.....	94	97	97	97	101	96	85	86	89	89	89	89	89	89	89	89	89	89	89	89	103	106	105
New Hampshire.....	97	97	95	95	96	97	92	92	92	92	92	92	92	92	92	92	92	92	92	92	98	101	98
Vermont.....	93	88	103	103	100	96	80	63	63	63	63	63	63	63	63	63	63	63	63	63	100	106	98
Massachusetts.....	98	100	103	103	100	96	80	63	63	63	63	63	63	63	63	63	63	63	63	63	102	99	98
Connecticut.....	103	100	97	97	92	92	89	72	57	57	57	57	57	57	57	57	57	57	57	57	103	100	103
New York.....	89	88	93	93	89	89	72	57	57	57	57	57	57	57	57	57	57	57	57	57	103	101	105
New Jersey.....	89	105	97	97	88	88	77	45	45	45	45	45	45	45	45	45	45	45	45	45	103	98	113
Pennsylvania.....	98	96	96	96	98	98	94	86	74	74	74	74	74	74	74	74	74	74	74	74	115	103	116
Delaware.....	90	100	100	100	100	100	94	86	74	74	74	74	74	74	74	74	74	74	74	74	100	100	106
Maryland.....	104	102	98	98	99	99	99	97	89	89	89	89	89	89	89	89	89	89	89	89	100	101	111
Virginia.....	103	102	99	99	93	93	99	97	86	86	86	86	86	86	86	86	86	86	86	86	110	105	114
North Carolina.....	94	82	94	94	93	93	93	98	101	101	101	101	101	101	101	101	101	101	101	101	102	98	104
South Carolina.....	99	79	99	99	103	103	103	98	98	98	98	98	98	98	98	98	98	98	98	98	102	102	103
Georgia.....	111	66	97	97	104	104	102	99	98	98	98	98	98	98	98	98	98	98	98	98	106	106	111
Florida.....	97	61	100	100	105	105	105	100	100	100	100	100	100	100	100	100	100	100	100	100	106	103	94
Alabama.....	106	61	88	88	101	101	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	103	107
Mississippi.....	95	79	90	90	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	100	103	106
Louisiana.....	91	94	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	100	103	107
Texas.....	118	79	87	87	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	103	108	96
Arkansas.....	112	66	75	75	52	52	52	75	95	95	95	95	95	95	95	95	95	95	95	95	103	108	107
Tennessee.....	107	89	94	94	79	79	89	92	104	104	104	104	104	104	104	104	104	104	104	104	109	100	117
West Virginia.....	103	105	100	100	98	98	100	100	84	84	84	84	84	84	84	84	84	84	84	84	112	102	121
Kentucky.....	110	96	100	100	85	85	99	99	101	101	101	101	101	101	101	101	101	101	101	101	115	106	134
Ohio.....	104	89	93	93	89	89	88	95	84	84	84	84	84	84	84	84	84	84	84	84	113	103	116
Michigan.....	84	87	98	98	100	100	95	86	61	61	61	61	61	61	61	61	61	61	61	61	122	102	122
Indiana.....	97	86	93	93	73	73	89	98	83	83	83	83	83	83	83	83	83	83	83	83	115	102	115
Illinois.....	87	74	85	85	56	56	57	86	99	99	99	99	99	99	99	99	99	99	99	99	115	104	118
Wisconsin.....	111	58	92	92	86	86	88	99	94	94	94	94	94	94	94	94	94	94	94	94	108	103	131
Minnesota.....	96	72	80	80	78	78	71	73	81	81	81	81	81	81	81	81	81	81	81	81	92	93	97
Iowa.....	89	57	87	87	72	72	73	87	97	97	97	97	97	97	97	97	97	97	97	97	110	101	112
Missouri.....	92	92	94	94	59	59	93	97	95	95	95	95	95	95	95	95	95	95	95	95	107	102	105
Kansas.....	106	91	93	93	36	36	91	87	93	93	93	93	93	93	93	93	93	93	93	93	116	101	98
Nebraska.....	101	80	101	101	54	54	93	60	86	86	86	86	86	86	86	86	86	86	86	86	125	105	97
California.....	97	80	97	97	90	90	98	98	98	98	98	98	98	98	98	98	98	98	98	98	106	98	125
Oregon.....	105	86	97	97	93	93	92	91	96	96	96	96	96	96	96	96	96	96	96	96	110	101	115

Table showing the condition of the crops, &c., on the 1st day of September, 1876—Continued.

States.	BEANS.		SORGHUM.		SUGAR-CANE, (not sorghum)		HOPS.		STOCK-HOGS.		WOOL.	APPLES.	PEACHES.	GRAPES.
	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Average condi- tion Septem- ber 1.	Number for fattening com- pared with last year.	Average condi- tion as to weight and size.	Weight of fleece com- pared with an average clip.	Average condi- tion Septem- ber 1.	Product com- pared with an average.	Average condi- tion Septem- ber 1.
Maine.....	91	.....	.....	.....	.....	.....	94	78	103	100	97	74	.....	88
New Hampshire.....	92	.....	.....	.....	.....	.....	100	.....	103	103	100	112	81	94
Vermont.....	104	.....	.....	.....	.....	.....	92	18	104	103	97	71	.....	100
Massachusetts.....	87	.....	.....	.....	.....	.....	.....	.....	94	98	103	93	60	97
Connecticut.....	63	.....	.....	.....	.....	.....	100	100	101	105	101	111	66	97
New York.....	88	.....	.....	.....	.....	.....	105	87	97	99	98	92	57	92
New Jersey.....	100	.....	.....	.....	.....	.....	.....	.....	101	100	100	103	85	86
Pennsylvania.....	92	.....	.....	.....	.....	.....	95	35	99	100	100	106	84	95
Maryland.....	100	104	.....	.....	.....	.....	110	100	103	104	100	106	88	94
Virginia.....	94	.....	.....	.....	.....	.....	91	53	103	101	98	91	36	87
North Carolina.....	92	.....	.....	.....	.....	.....	.....	.....	100	101	101	93	49	92
South Carolina.....	92	.....	.....	.....	.....	.....	101	100	106	100	101	86	23	90
Georgia.....	97	.....	.....	.....	.....	.....	101	100	105	102	101	75	28	92
Florida.....	96	.....	.....	.....	.....	.....	100	.....	105	94	98	62	50	79
Alabama.....	99	106	.....	.....	.....	.....	101	101	113	105	101	67	35	91
Mississippi.....	104	.....	.....	.....	.....	.....	.....	.....	119	114	102	62	16	84
Louisiana.....	100	102	.....	.....	.....	.....	107	.....	107	106	101	54	14	73
Texas.....	99	.....	.....	.....	.....	.....	95	.....	103	102	102	88	52	80
Arkansas.....	100	.....	.....	.....	.....	.....	110	.....	119	108	100	70	6	74
Tennessee.....	99	.....	.....	.....	.....	.....	.....	.....	109	107	102	88	26	86
West Virginia.....	97	.....	.....	.....	.....	.....	99	99	101	100	102	91	35	93
Kentucky.....	100	.....	.....	.....	.....	.....	.....	.....	88	98	97	91	29	90
Ohio.....	94	.....	.....	.....	.....	.....	95	99	95	98	97	105	21	87
Michigan.....	98	.....	.....	.....	.....	.....	108	.....	103	101	103	111	91	87
Indiana.....	97	.....	.....	.....	.....	.....	99	106	103	96	99	101	40	84
Illinois.....	92	.....	.....	.....	.....	.....	.....	.....	89	97	100	88	44	78
Wisconsin.....	97	.....	.....	.....	.....	.....	98	82	99	96	100	122	.....	97
Minnesota.....	64	.....	.....	.....	.....	.....	102	.....	103	97	100	106	.....	98
Iowa.....	75	.....	.....	.....	.....	.....	103	101	102	97	102	121	122	99
Missouri.....	93	.....	.....	.....	.....	.....	.....	.....	99	99	100	74	40	75
Kansas.....	92	.....	.....	.....	.....	.....	.....	.....	132	111	100	97	34	98
Nebraska.....	61	.....	.....	.....	.....	.....	.....	.....	129	105	100	104	.....	98
California.....	96	.....	.....	.....	.....	.....	100	97	118	97	99	93	90	98
Oregon.....	100	.....	.....	.....	.....	.....	105	101	96	102	103	92	153	102

Table showing the condition of the crops, &c., on the first day of August, 1876—Continued.

States.	HAY.			PASTURE.	BEANS.	COTTON.	SORGHUM. (not Sorghum.)	SUGAR-CANE. (not Sorghum.)	APPLES.	PEACHES.	GRAPES.
	Average condition of timothy August 1.	Product of clover compared with last year.	Average condition of clover when harvested.								
Maine.....	105	104	102	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.
New Hampshire.....	102	89	102	102	101	.....	.....	.....	102	94	90
Vermont.....	102	79	99	101	100	.....	.....	.....	102	97	97
Massachusetts.....	91	100	101	95	101	.....	.....	.....	88	50	107
Rhode Island.....	82	96	108	45	55	.....	.....	.....	73	53	109
Connecticut.....	90	100	98	87	87	.....	.....	.....	73	77	100
New York.....	99	101	96	103	96	.....	.....	.....	92	59	99
New Jersey.....	87	104	96	56	78	.....	.....	.....	83	73	99
Pennsylvania.....	105	102	99	102	99	.....	.....	.....	106	56	101
Delaware.....	98	107	93	97	97	.....	.....	.....	87	50	98
Maryland.....	102	104	97	97	101	.....	.....	.....	101	48	98
Virginia.....	101	112	103	88	83	99	101	.....	85	34	94
North Carolina.....	100	97	96	94	91	96	94	.....	86	49	94
South Carolina.....	100	102	103	102	102	97	104	.....	91	31	90
Georgia.....	100	107	102	107	104	104	103	.....	78	29	86
Florida.....	.....	.....	.....	100	.....	.....	.....	.....	99	81	83
Alabama.....	104	109	106	104	101	103	100	109	70	33	83
Mississippi.....	.....	95	110	99	96	92	100	97	62	12	86
Louisiana.....	.....	.....	.....	98	.....	89	.....	91	46	19	73
Texas.....	109	118	110	114	103	106	101	105	79	54	99
Arkansas.....	107	109	101	115	100	98	105	105	80	12	98
Tennessee.....	107	118	106	116	99	120	104	.....	88	19	93
West Virginia.....	107	110	104	105	98	.....	.....	111	91	53	98
Kentucky.....	101	121	105	107	97	.....	100	.....	85	40	85
Ohio.....	104	112	94	109	95	.....	97	.....	96	19	85
Michigan.....	112	116	97	113	100	.....	97	100	104	90	98
Indiana.....	107	101	86	102	95	.....	.....	.....	80	41	98
Illinois.....	108	111	92	115	90	.....	94	.....	84	49	92
Wisconsin.....	105	90	98	105	97	.....	97	.....	109	.....	97
Minnesota.....	86	90	99	93	86	.....	92	.....	99	.....	100
Iowa.....	105	102	98	106	98	.....	97	.....	114	115	98
Missouri.....	104	106	101	111	98	86	93	.....	69	47	76
Kansas.....	102	115	96	106	96	.....	.....	.....	91	38	100
Nebraska.....	105	106	110	105	102	.....	104	.....	127	85	113
California.....	111	112	105	109	97	.....	.....	.....	91	91	99
Oregon.....	106	101	103	116	100	.....	.....	.....	100	89	117

EXTRACTS FROM CORRESPONDENCE.

GRASSHOPPERS.—*Georgia*—*Bartow*, August 1: Within the past week grasshoppers have made their appearance in alarming numbers in some localities, and are doing considerable damage. One corn-field of twelve acres has not a blade of fodder left on it, and many of the young ears are destroyed. This has all been done this week. *Carroll*: A very destructive kind, never before seen here, have made their appearance. Some are green, some yellow, and some striped. Some corn-fields are already stripped of their blades, and some cotton-fields of their leaves. All appear to be moving in a northwest direction. *Cobb*: It looks as if the grasshoppers would give us a great deal of trouble. They are very numerous in places, and are devastating all pasturage. On some plantations they have commenced their ravages on cotton and corn. They are supposed to be the same species that ravaged the Western States a year or two ago. The farmers are killing them in great quantities, but it does little good. *Floyd*: Have made their appearance in many localities. They are very numerous, and probably will do a great deal of mischief. They have thus far confined their depredations principally to the clover and stubble fields, though they have damaged the crops of cotton and corn in some cases. *Fayette*: Are doing some damage to crops in places. *Fulton*: Made their appearance on the first day of July. They caused great alarm, but are doing little damage. They are migrating southward. *Henry*: Have made their appearance, but as they seem to operate on the stubble-lands, they have not done much damage as yet. *Walton*: Are doing damage in some localities. *Wilkes*: Appearing in quantities in some places. No serious injury.

Tennessee.—*Lincoln*: Are numerous. They are now destroying our clover-fields and injuring other crops.

Minnesota.—*Jackson*: Are here yet; it is a hard matter to estimate the damage done by them. *Meeker*: Will injure the wheat in a few places. *Nicollet*: Are destroying the crops and depositing their eggs. *Nobles*: Came upon us just as the earliest grains were ready to harvest. Wheat, corn, and timothy are very badly damaged, and other crops totally destroyed. They have laid eggs for a crop next year. *Pope*: The prospect of uncommonly good crops was very fine until about two weeks ago, when the grasshoppers came. Though they did incalculable injury, yet they did not stay long enough to effect a total destruction of crops. The air was filled with the pest, clouding the sun. They did not seem to design utter destruction of vegetation, but rather to leave their progeny. Eggs were laid all over the region. This work done, they rose on favoring winds and went southeast. Their stay on an average was about one week—in some places, only four days; in others, ten. *Redwood*: Damaged all the crops. The vines of beans and potatoes have been almost wholly eaten up, and the foliage of fruit and certain forest-trees almost wholly stripped off. *Sibley*: In eight townships the crops have suffered severely from grasshoppers. *Stearns*: The advance guard came on the 22d of July; the main army appeared the next day about 11 a. m., and by 4 p. m. every bush, flower, tree, shrub, fence, and field was literally covered with them. They are still with us, and are depositing their eggs. *Stevens*: There would have been a full average of all crops, and perhaps more, had not the grasshoppers visited this county. *Todd*: The grasshoppers struck us the 19th of July, and have

destroyed at least 67 per cent. of the crops of this county. As near as I can find out, the column is about seventeen miles wide. They came in from the west by north. One of the finest crops we have had for ten or twelve years is destroyed. There is barely enough left to pay for reaping. Yesterday I cut barley that should have yielded fifty-eight bushels per acre, and I will scarcely get five. The heads are cut off and lying on the ground. *Watowan*: Have destroyed the wheat-crops of the county. *Yellow Medicine*: In the counties Renville, Chippewa, and Swift, and parts of Kandiyohi and Yellow Medicine, oats and barley are a complete failure, on account of the grasshoppers. *Blue Earth*: The western towns are alive with grasshoppers, but they have come rather late to seriously injure wheat or oats.

Iowa.—*Clay*: The total failure of some crops, and the partial failure of others, is owing to the grasshoppers. Thousands of acres of grain and vegetables have been destroyed. They will be the cause of driving out many settlers. *O'Brien*: Came in immense swarms on the 27th of July. The destruction has already been very great, and they are still here. *Sioux*: The grasshoppers came down last week; corn is half destroyed, and unless they leave soon will be a total failure. *Woodbury*: The grasshoppers have pretty generally destroyed corn throughout the Territory of Dakota. They have done some damage to the crop in the northwestern counties of this State, but have not visited this county.

Colorado.—*Weld*: Made their appearance August 1. One day and night served to strip corn, gardens, late oats, and buckwheat. To-day (August 2) they have nearly all gone from here to the southeast. Corn being generally backward will be a total loss. *Park*: The prospect is that we shall not be troubled with grasshoppers.

Montana.—*Choteau*: Have destroyed almost the entire grain-crop. All the wheat is gone. The stock-range has been also eaten to a great extent; many spots are entirely bare. *Jefferson*: The decrease in crops arises from the ravages of grasshoppers. They have all gone southwest.

Dakota.—*Buffalo*: The entire corn-crop has been eaten by the grasshoppers. Wheat and oats, owing to the drought, ripened early, and were harvested in time to escape them. *Clay*: Have destroyed nearly all the corn, and about half the wheat and oats. They are now depositing eggs. It is the worst grasshopper raid ever known. *Hanson*: We are again visited by the everlasting grasshopper. They have been with us for the last four days, and have left nothing of corn and buckwheat but the naked stalks. Oats are badly damaged; wheat and barley were nearly harvested before they came, and potatoes and sorghum were slighted by them; but they went through the gardens like a whirlwind. *Minnehaha*: Have made their appearance slightly, and have damaged some fields. *Richland*: Are now upon us. They came yesterday, August 1; a few days late. Gardens are all swept clean; not very much damage done to grain. *Stutsman*: Did but little damage except to oats, which they nearly destroyed. There are none here at present.

New Mexico.—*San Miguel*: In the spring the grasshoppers did a great deal of damage to small grain in parts of the county. *Taos*: The grasshoppers continue their work of destruction in this valley. They have done great damage to the crops, but corn is doing well, as they have not touched it in the whole county.

Pennsylvania.—*Westmoreland*, September 1: Did some injury to corn. *Washington*: Have injured pastures.

Virginia.—*Franklin*: Still damaging the tobacco.

Georgia.—*Bartow* : Killing out some clover-fields and doing some damage to corn and cotton. *Forsyth* : Have appeared on some farms in considerable quantities, and are destroying some fodder, &c. *Floyd* : Have been destructive in some localities to both cotton and corn, and are still devastating entire fields.

Alabama.—*Etowah* : Have devoured clover-crops in several localities.

Tennessee.—*Campbell* : More abundant than ever known ; hatched out about the 20th of June ; now from 1 to $1\frac{1}{2}$ inches long ; have begun to eat the corn-blades.

Kentucky.—*Calloway* : The grasshoppers and bugs have nearly destroyed our turnip-crop. *Logan* : Devoured much of the tobacco as soon as set out.

Ohio.—*Athens* : Injured grasses.

Minnesota.—*McLeod* : Came from the northeast about the middle of July, and spread nearly over the whole county. Have injured oats, barley, and late corn considerably and wheat to some extent, and have deposited many eggs. Some are reported as hatching, and others as being destroyed by a worm or insect ; but millions apparently will be left to hatch next spring. *Yellow Medicine* : Grasshoppers and dry weather have nearly ruined the corn-crop and taken nearly all the oats. Half of the State is covered with grasshoppers. *Redwood* : Grasshoppers and drought have destroyed the crops this year more than ever before. *Swift* : Have done a great deal of damage. They commenced depredations about the 5th of July ; there have been three or four swarms. They are now mostly gone, but have left their eggs in great numbers. *Faribault* : Injured corn 10 per cent., potatoes 50 per cent., and nearly destroyed beans. About the 15th of August they lit down on us from the northwest in countless numbers. They were about eight days in passing over the county and seeding it with eggs to such an extent as to destroy all hopes of crops for the coming year. *Meeker* : Destroyed nearly all the beans. *Nicollet* : Came with the wind from the north and west and went south and west. Of cereals, they cut the oats most ; destroyed much of the corn and potatoes and garden-stuff. They have been depositing their eggs for the last two months. *Brown* : Reduced corn, wheat, and rye to 25 ; oats, barley, and buckwheat to 10. *Blue Earth* : Injured the corn somewhat and ruined beans. The county is literally filled with their eggs. Some of the eggs are being eaten by a small worm or maggot, and some by a small red bug. *Nobles* : A small amount of corn and wheat escaped the grasshoppers ; other crops are almost a total loss. *Stevens* : Have cut down our crops fearfully within the past month. *Todd* : Are all over the county ; there is scarcely a foot of prairie or timber land on which eggs cannot be found. *Stearns* : Overrun the county and deposited millions of eggs. *Rock* : Everything was favorable for excessive crops when the grasshoppers came. They reduced wheat 50 per cent. ; corn and oats, 67 ; potatoes, 75, and ruined beans.

Iowa.—*Crawford* : Injured corn 33 per cent. *Clay* : Have nearly ruined our crops. *Harrison* : Made their appearance on the 17th of August ; reduced an extra corn-crop to an average ; destroyed buckwheat and gardens, are injuring fruit, and depositing their eggs over the whole county. *Humboldt* : Have injured corn and nearly ruined buckwheat and beans. *Calhoun* : Have trimmed around corn-fields and so injured buckwheat that it will not be cut. *Cherokee* : Came with a north wind, on the 6th of August, staid two weeks, and have deposited eggs to some extent. They damaged wheat slightly and a very heavy corn-crop at least 25 per cent. *Sioux* : Reduced corn to 40 ; wheat and barley to 70 ; oats to 80, and potatoes to 10. *Greene* : Swarm of grass-

hoppers are destroying the county. *Montgomery* : Came August 25. Have done no injury as yet, except in a few gardens. They seem uneasy as if they desired to leave. The wind has only been favorable for them one day since their arrival. *Audubon* : Came in clouds on the 24th of August ; are doing some damage on the corn and filling the ground with eggs. *Guthrie* : Coming on us during the last week by millions. Looks as if they intended to stay with us, and if they do our crops will suffer greatly. *Pottawattamie* : Made their appearance in strong force on the 23d of August. Have done considerable damage and are laying eggs in large quantities. *Pocahontas* : Have come and gone again without doing much damage except to gardens. *Sac* : The red-legged grasshoppers came about the 15th of August in such numbers as to materially injure our growing crops.

MISSOURI.—*Atchison* : Are coming down upon us to-day in great numbers.

Kansas.—*Mitchell* : Came from the north, the wind being from that direction, August 23. Began to come down at 9 in the morning, and by night the ground was literally covered with them. They commence to go into the crops as the sun goes down, on the south and west sides of the field. They are eating the blades off the corn, which is loaded with them, and the leaves off the trees. Early corn is now quite hard, and will not be seriously injured. *Paynee* : Made their appearance August 24, coming from the northwest. Most of them passed over, but a few alighted, owing to the changing of the wind to the south. Corn is too far advanced to be injured, and they are not doing much harm except to gardens. *Washington* : Visited us August 24, at 11 o'clock in the morning, coming from the northwest. So far they have alighted on about half of the county. They are stripping the blades from the corn, but appear to pay more attention to the process of incubation than feeding. The prevalence of a south wind has kept them here until to-day, (August 31.) The north wind is now blowing, and they are filling the air by the million, passing rapidly to the northwest. They have deposited no eggs, and done little damage. *Ellis* : A visitation from grasshoppers last week ruined the late corn, and injured all somewhat. *Reno* : Commenced to alight August 31, at 11 in the morning, and are eating everything green. At 2 p. m. to-day, September 1, many of them flew away. They have almost ruined the late crops, especially corn. *Norton* : Have ruined the corn-crops. *Barton* : Appeared August 24 from the north, in vast swarms, and have destroyed all late corn and potatoes, beans, turnips, &c., and the wheat that was up. To-day, August 31, with a strong north wind, they are going south. They have made no deposit of eggs. *Graham* : Descended in clouds, and remained five days, destroying our corn, buckwheat, turnips, and gardens. *Rice* : Have returned, for the last week, in as great numbers as two years ago. The corn, except the late sod corn, which they have riddled, was out of their way. They have mostly left. *Republic* : Filled the air, August 24, when corn-fields were ravaged, and gardens disappeared in an afternoon. We have the assurance that we shall raise our own grasshoppers next year, for initiatory steps are being taken to give us a large supply. *Butler* : On the last day of August, I was in Wichita, Sedgwick County. About 4 o'clock p. m., a very large column of grasshoppers passed over. In their flight they made a noise like the rattling of a train of cars. I do not know how far the column extended west, but it extended more than twelve miles east of Wichita. Their flight was toward the south. Although the main part passed over, enough stragglers were left in the valley of the Arkansas to eat every vestige of

green wheat as fast as it came out of the ground. Some few appeared as far east as El Dorado, but no damage worthy of mention has yet been done in Butler County.

Nebraska.—*York* : The grasshoppers have called on us again. They came down August 10 from the northeast and staid two weeks to a day. August 24 they left, going southeast. They have eaten almost everything green, destroying all garden vegetables and taking the leaves off the trees. The fruit-trees, such as apple, cherry, and plum, are leafing and blossoming again. The plum-trees have ripe fruit and blossoms, which is something I never heard of before. *Furnas* : Came down in dense clouds from the northeast, so thick as to darken the sun, having the appearance of vast clouds of smoke. Nothing of the kind has equaled this raid since the earliest history of the country. Some have laid eggs. We are compelled, as in 1874, to note an almost total destruction of corn and all late vegetables. *Knox* : Entirely destroyed the corn and garden-products and the oats so badly that many fields were not reaped. *Osage* : Came August 24, and are still here. Have taken potatoes, buckwheat, and beans clean ; have injured corn about 15 per cent. and are still at work on it. Have deposited eggs in great quantities. They incline to travel southeast, but the wind is against them. *Cuming* : Came from Dakota August 4 ; staid about ten days ; injured late corn and potatoes, beans, gardens, &c. ; deposited many eggs, and have nearly all gone southward. Insects will destroy their eggs, and birds, quails, and prairie-chickens will eat their young when quite small in untold millions. In their matured state nothing can successfully cope with them save quails, prairie-chickens, and other insectivorous birds. *Dodge* : Swept down upon us from the great Northwest August 10, bringing terror to the hearts of our people. They remained about two weeks and deposited eggs in immense numbers. Hops were entirely destroyed ; fruit-trees are stripped of their leaves and in some sections of the new growth of bark. But half the corn is left. *Webster* : Injured corn slightly. *Franklin* : Damaged corn 50 per cent. Have now all gone southwest. *Adams* : Have taken about half the corn and injured young trees 50 per cent. *Saunders* : Have re-appeared since the last report. Corn, potatoes, and sorghum have been largely damaged ; tobacco, buckwheat, and beans have been wholly and gardens mainly destroyed ; and the earth is filled with eggs. *Seward* : Came from the north in immense quantities. They fed upon the corn and cultivated grapes, and destroyed 80 per cent. of the buckwheat. A few linger still in the south part of the county, traveling southwest. *Thayer* : Alighted about a week ago. Have injured corn very badly and taken all the garden-products. *Boone* : Came in large numbers August 3. Have destroyed all buckwheat, beans, and late corn, stripped the foliage from all young trees, and killed young fruit-trees. They staid about three weeks ; have all gone south. *Lancaster* : Are eating everything. *Platte* : In their flight south visited our county on the 10th of August, and in consequence of adverse winds remained two weeks. They entirely ruined late corn, made general havoc of vegetables, and filled our land with eggs. *Wayne* : Alighted and commenced work August 6 and 10. Injured late corn 25 per cent., potatoes slightly, deposited their eggs, and left August 13. *Antelope* : Came from the north August 5 in countless numbers, and swept late corn, buckwheat, potatoes, and beans clean. *Richardson* : First appeared yesterday, August 30, in small numbers from the northwest. *Merrick* : Crops promising up to the 10th of August, when the grasshoppers came with the wind from the north. The next day the wind changed and continued rather strong from the south for a week. The hoppers had

to stay on the ground and could not do much damage. On the 18th, the wind being from the northeast, they left, but toward evening a lot more came. On the 24th all left for the south. Buckwheat, late beans, garden-vegetables, late potatoes, &c., are a total loss. On the 17th some deposited eggs where the ground was bare. *Hall*: Large swarms appeared from the northwest August 10 at noon. Commenced depositing eggs on the 13th and 14th; on the 14th some left; still larger masses came in their stead, mostly from the northeast. Farmers generally tried to smoke them out, but most abandoned the effort after the third day. I protected my garden from ten days, but from the 11th to the 13th they piled in on me so fearfully that I could not keep them from stripping nearly every tree of its foliage. They have eaten about one-third of the apples and half the early with all the late corn. On the 23d and 24th they left in a southern direction, the wind being from the northwest.

Colorado.—Fremont: Appeared on the 5th of August. Have destroyed 75 per cent. of the corn, all the buckwheat, and a large portion of garden-vegetables. Millions have left, but many more have come to take their place. *Weld*: Destroyed all the buckwheat, nearly all the corn, and badly injured potatoes.

DISEASES AMONG FARM ANIMALS.—North Carolina.—Camden, August 1: Hogs are dying rapidly in some sections of the county, and the prospects of the pork-crop are not flattering. In some neighborhoods the disease seems to be quinsy; in others measles.

Florida.—Jefferson: Some complaint of cholera among hogs. *Madison*: Cholera among hogs reported in some places. *Suwannee*: Hog cholera very destructive in some localities, and some complaints of black-tongue among cattle. *Santa Rosa*: During the year I frequently noticed great losses of hogs from disease. When living seven miles south of Montgomery, Ala., we usually killed about 150 fine hogs annually, and though the hog-disease was all around us, we never lost but one hog. We prevented the disease by giving them copperas, mixed with chops, once or twice a week. We also frequently mopped them with coal-tar. The object in this last was to keep the lice off. The only hope is to prevent the disease, not to cure it.

Alabama.—Conecuh: At my last report a few hogs were dying with cholera. From the 1st to the 20th of July, some farmers lost almost their entire stock. It is generally estimated that at least 75 per cent. of all the hogs within 5 miles of Evergreen have died within the last six weeks. I gave my hogs spirits of turpentine, and all recovered. *Dale*: Hogs are dying with cholera; not many in the county. *Jefferson*: Hogs are dying with some disease called cholera.

Arkansas.—Prairie: We are having trouble with a disease among our horses. They are taken as in the epizooty, and after they apparently recover they break out with immense sores like boils, for which there is discovered, so far, no remedy.

Tennessee.—Monroe: Hog cholera is still prevailing in some localities; 50 per cent. have died. Some have lost 40 out of 60. We have now found out that calomel will cure them.

Indiana.—Huntington: A great many hogs are dying with cholera, some farmers losing nearly all they have.

Illinois.—Jackson: In the northern part of this county hogs are dying from some disease like measles.

Missouri.—Clay: A great fatality among hogs from cholera. *Cole*: Hog-cholera still raging.

BRIGHTENING PROSPECTS.—Georgia.—Mitchell, August 1: Our crop-

prospects are better at this date than for ten years past. The corn-crop is now safe, and the fodder being pulled ; the yield of this cereal, owing to the greatly increased area, will be ample for home-supplies, and will greatly increase the supply of meat, as the hogs will be better fed than usual. All kinds of stock are remarkably healthy and in fine condition, especially cattle and sheep, and our people are better supplied with beef and mutton than at any time since the war. Our farmers will now be able to live at home, and have their cotton-crop as a money surplus. The failure of the fruit-crop is seriously felt, and will greatly increase the bilious disorders of our section. *Thomas* : The season is fine. Corn is made, and a better crop than any since 1865. There is no boll-worm or caterpillar, and cotton looks well. Sugar-cane is good, and the acreage larger than usual. Farmers are hopeful. We have an abundant supply of feed, and if we had hogs we would make a full supply of meat and bread without going West for any. The cholera killed our hogs. *Troup* : I never saw such a year in my life. Seasons have been very favorable for all crops. If no disaster befall us we will have the best crops made since the war. Corn is out of danger. *Heard* : The seasons are fine, and our crop-prospects are the best we have had for years.

Florida.—Lery : This has been the best season for crops since 1866. Reports from all parts of the State represent that the crop-prospects are better than usual. There are no reports of insects. The new settlers in this county are well pleased with the climate, especially its healthiness, and there is a prospect of a large immigration from the North this fall.

Alabama.—Russell : Crops are better now than at any time since the war, and the prospect for the farmer is very flattering. Freedmen have done more and better work, with less trouble and rations, than in any year since they have been free. They are beginning to see and act for themselves. One great cause of this reform is that a large per cent. of the most worthless ones emigrated to the West last winter.

Texas.—Kendall : The yield of corn will be fully double that of any year for the last ten. The prospects for cotton are excellent. Potatoes promise an immense yield ; and the yield of wild fruit, such as grapes, cherries, apples, and plums, is unprecedented. *Nacogdoches* : The prospect for all kinds of crops is better than for the last six years ; for corn better than for fifteen years. The corn forwarded from the Department is three to four weeks earlier than any we have had, and suits this climate. *Navarro* : The corn-crop is better than for many years. Some claim to have made, without subsoiling, 60 to 75 bushels per acre. The average will be about 50 bushels per acre. *Robertson* : Not only in this county, but all over this section of country, we are having the most plentiful crops for years. *Live Oak* : Five times as much corn as last year was planted, and the yield is twice as great.

Arkansas.—Baxter : Crops of all kinds are looking well. Quite a number of farmers are buying reapers, mowers, and other improved implements for cultivating the soil. *Izard* : The general outlook for the farmer of this county was probably never better than at present. His labors last year were richly rewarded. Abundant supplies of food and forage have enabled him to prosecute his work this season with unusual vigor, and his efforts have again been greatly blessed. Neither drought, flood, nor storm has befallen him ; no prevailing disease affects his domestic animals, and peace and plenty reign throughout the land.

Indian Territory.—Choctaw Nation : We have had an unusual amount of rain this season. Corn is splendid. One old white farmer in Paul's Valley, in the Chickasaw Nation, has now 35,000 bushels of old corn on hand, besides several hundred acres in corn now that will average 60

bushels to the acre. There is no hay in this Nation, save the wild prairie-grass, but the wet season has kept the prairies green with a most excellent crop for hay.

Dakota.—Davison: The crops of wheat and oats are better than ever before. They are nearly all harvested, and the berry is plump and of good color. Corn and potatoes are as good as could be desired, This year is one of plenty.

HARVEST ASPECTS.—Maine.—Penobscot, September 1: Crops of all kinds are good, and harvested in good order.

New Jersey.—Ocean: By those in this section who depend upon agriculture for a subsistence this season will long be remembered as being one of the most discouraging ever experienced. The low price of produce combines with the excessive drought, which has so materially shortened the crops, to make the season a hard one.

Pennsylvania.—York: Harvest is over; the weather was fair, and all the crops housed are large in quantity and good in quality. All the products of the earth in this centennial year are blessed. Everything is good and fruitful, except work and money.

Virginia.—Loudoun: Farmers all seem satisfied with their crops, but many are disheartened by the extremely low prices. Our county mills generally give \$1 per bushel for wheat, and this pays better than shipping. Freight and commission very often reduce the price to 60 and 75 cents per bushel, in the neighboring town of Alexandria. Cattle have fattened well, but beef is very low. I cannot see that our farmers will make any money this year. *Sussex:* So far as my observations here and information from other sections of the State extend, I feel like congratulating the people of this county, and, indeed, of all Virginia, on the magnificent prospects for corn, cotton, and meat. I have no doubt that we are rapidly returning to our former happy state of "peace and plenty." Providence has certainly smiled on us this centennial year. *Greenville:* The farmers are turning attention to the making of their own meat and hay, and the good crops are producing quite a cheerful prospect.

Alabama.—Russell: The indications are that the adverse fortunes which have so long oppressed our country are to be lifted and prosperity again greet us. Food-crops are abundant all over our land. For the first time in years this county will not have its granaries in the West. Heavy interest on the bread eaten and hopeless regrets belong to the bitter memories of past struggles. Cotton will soon become, as it should, a surplus crop in this section. Economy, hard work, and prudent husbandry have accomplished a wonderful reform in this part of the country. *Limestone:* Our people, being convinced that raising cotton alone is ruining them, are turning much of their time to the raising of provision-crops.

Arkansas.—Franklin: Bread and meat are now abundant and cheap, and so is land. It is a favorable time for immigration, and we have plenty of room.

MINOR CROPS.—Maryland.—Wicomico: It is estimated that over a million watermelons have been shipped from this county this year.

New York.—Wayne: There is an immense crop of peppermint; the greatest yield of peppermint-oil ever known.

Virginia.—Prince George: Peanuts are looking well, though the stand is not good.

South Carolina.—Spartanburgh: The green worm has completely destroyed the cabbage-crop; no remedy found as yet.

Georgia.—*Liberty*: The pea-crop is promising. *Jefferson*: The pea-crop is promising. *Twiggs*: We have a good crop of pease.

Florida.—*Hamilton*: Pease are doing well. *Putnam*: The orange-crop is good.

Alabama.—*Jefferson*: Chufa is being tested extensively and gives general satisfaction. My opinion is that it will prove more valuable to the South, as food for hogs and hay for cattle, than any other crop. *Shelby*: The pea-crop is promising.

Texas.—*Rusk*: Ground-pease are doing well and promise a large yield.

Ohio.—*Lucas*: The cabbage-worm is doing great injury.

Missouri.—*Lawrence*: Flax yields 14 bushels of seed per acre. *Vernon*: Flax was cut short by wet and weeds; yield not over 2 bushels per acre. Castor-beans are 2 per cent. above average.

Tennessee.—*Sumner*: There is a growing interest in this county in cultivating broom-corn. There are instances in which the land at \$40 per acre has been purchased with one crop of broom-corn.

Texas.—*Shackelford*: Had there been a column for broom-corn I should have marked it 100.

SUPERSEDING COTTON WITH CEREALS.—*Texas*.—*Austin*: Owing to short crops of cotton for the past two years, and the low price, with no prospect for improvement in the immediate future, many of our cotton-farmers are becoming disheartened and directing their attention to other agricultural pursuits. Cotton has been grown as a specialty so long, and there being no present market for other products, it is rather difficult to decide which to choose. But Galveston is now just commencing to ship grain, and the production of small grain is recommending itself to our farmers. As there is generally a lack of working force this will perhaps be the easiest to cultivate and the most profitable. It remains to decide which are the varieties best adapted to our locality. Experience has shown that the white starchy varieties of wheat and oats will not succeed as a general thing; but as the red rust-proof oats succeed admirably, it is safe to infer that the red, hardier, and coarser varieties of wheat would also do well. It is stated that these varieties succeed in North Africa, which has a climate much the same as this part of Texas. Different varieties of barley succeed very well here, but as yet have been cultivated only on a very limited scale, since there was no market. A local market is now developing, and several farmers intend to enter into the production of barley. With proper care, very good tobacco can be grown here, and it is desirable to give several varieties a trial. We naturally look to the Department for aid in this effort to extend the number of our staple products.

GERMAN MILLET.—*Georgia*—*Gwinnett*: German millet, lately introduced here, is a wonderful success. It yields more forage than any other crop.

Arkansas—*Arkansas*: In this county millet is quite a success. Over two-thirds of the farmers are raising it, and the crop is looking beautiful. *Izard*: The only hay-crop worth noticing is German millet, which is quite promising.

Tennessee—*Sullivan*: Millet is sown more than ever before, and promises an enormous crop on the land sown.

HUNGARIAN GRASS.—*Pennsylvania*—*Bedford*: Hungarian grass seems to gain favor with our farmers. Its great yield under fair culture and season makes it a profitable crop for feed. *Montgomery*: We are just introducing Hungarian grass. It matures in a short time, and is well spoken of by those who have tried it.

Georgia—Richmond : Hungarian grass was above average 10 per cent., and fully 50 per cent. above last year's crop.

Mississippi—Jackson : The Hungarian grass succeeded well, and is looked upon by our stock-men as a godsend to the South. Its true value is as yet understood but by few.

DESTRUCTIVE FLOODS.—*Arkansas—Arkansas* : The late floods have been especially severe on the bottoms, destroying thousands of acres of corn and cotton, both of which promised extra crops. Twelve inches of rain fell (July 13) in one day. Floods destroyed 25 per cent. of corn-crop and 35 to 40 per cent. of cotton-crop.

Montgomery, Tennessee : Floods very destructive; damage probably equal to that of the memorable freshet of 1837.

Morgan, Ohio : Rain-fall during July, 7.8 inches.

HARVEST WAGES.—*Howard, Iowa* : From \$2.50 to \$3 per day, with board, is demanded by harvest-hands.

HARD TIMES.—*Alabama, Franklin* : The oldest business men in the country say they have passed through all kinds of reverses and hard times, from 1837 down; but that they have never known anything to equal the present in the utter prostration of all business. There is absolutely nothing doing, and no money. *De Kalb* : Times are harder than ever before; trade of all kinds is dull, and a general gloom pervades this whole section.

BEES IN TEXAS.—The Italian honey-bees, introduced last year, are doing remarkably well.

TAR ON FRUIT-TREES.—*North Carolina, Montgomery* : According to the experience of Mr. Henry Reynolds of this county, tar is a perfect remedy for scarred and sun-cracked apple-trees. He says that by coating with new tar the trunk of a favorite fruit-bearer that was cracked and so decayed that the bark was dead and would peel off, he has restored it fully. He applies it to all the branches that show signs of decay. Since practicing this cheap remedy, he has not been troubled with insects. By applying tar to the trunk, and clearing away the surface at the roots so as to let it run down on them, peach-trees badly damaged by borers are fully restored. Replace the dirt, and you will have no more trouble with the tree for two years or more. If the tar is applied to young trees, the borers will not trouble them at all. He states that the coating should be applied in the winter, or early in the spring, with new tar.

MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

CRANBERRY-ROT.—In the Third Annual Report of the New Jersey State Board of Agriculture for 1875, page 66, the following statement appears :

Thus far the efforts of the New Jersey Cranberry Association to discover a remedy for the rot have been unsuccessful. Liming has not appeared to be in any degree effective. Both in regard to the malady, and in the cure or preventives suggested there is a very wide range of opinion, based upon observation of localities having very great differences of conditions.

It is true, doubtless, that the Cranberry Association has failed to

discover a remedy for the rot of the cranberry, and that among its members there is some difference of opinion as to its cause and cure; but it has been publicly acknowledged by the association that peaty fermentation of cranberry-bogs had never been considered a cause of cranberry-rot until it was demonstrated by the investigations of the microscopist of this Department; and the leading cultivators of the cranberry in New Jersey have acknowledged, by letter, from time to time, to the Commissioner of Agriculture, the great benefit of his labors to the State of New Jersey; and, furthermore, at a late annual meeting of the association the president stated that the investigations made by him (the microscopist) would save hundreds of thousands of dollars to the cranberry-growers of the State. All this is wholly overlooked by the writer.

But "liming," he says, "has not appeared to be in any degree effective." The fact is that liming has never been thoroughly tested. This statement may be rather startling to some cranberry-growers, as it is well-known that Dr. Merreman has used 40 bushels of lime to the acre, and others have probably done as much. This leads to the question, for what purpose was the application of the lime recommended? Lime may be employed to prevent the decay of wood and other organic substances, or it may be employed for their decomposition. We have examples of the first in ships and other wooden structures used in the transportation of burnt lime. In these cases the lime is in excess of the organic matter, and the moisture of the wood is absorbed by the lime, and all the proximate principles of the wood are preserved; but if the conditions are reversed, and water and organic fiber are in excess of the newly-burnt lime, the woody fibers will decay. Lime may be employed to reduce vegetable substances, to correct acid in the soil, for the solution of silica, or for the decomposition of salts of iron. The sulphate of iron is often found in peaty soils, in which case the lime would combine with the acid, forming sulphate of lime, and oxide of iron would be precipitated. But the main use of lime, as recommended to the cranberry-growers, is to correct the acid condition of the peaty matter. Had they, therefore, after a trial of one or two years, reported that the acidity of the soil had been corrected, yet without practical results, such a report would supply a good basis for criticism; but the cranberry-growers have made no practical examination of the soil since the lime was applied, and they are not, therefore, prepared to make an intelligent report on the subject. All that is asserted is that the berries on the newly laid out bogs rot as much as ever, while those on the superior old bogs do not.

The value of lime to wet cranberry-land can never be known without repeated experiments and careful observation of results.

The bad condition of the bog-lands was discovered by digging up the subsoil, by its taste and smell, by chemical analysis, and by its comparison with soils known to produce uniformly healthy fruit. Some soils have been found so bad as to be practically irreclaimable. As has been stated heretofore, the composition of cranberry-land varies very much in New Jersey, not only as to its composition, but as to the quantity and quality of its peaty matter. It varies in thickness from 3 inches to 6 feet. It is obvious, therefore, that if 40 bushels of lime are necessary to bring into proper cultivation 3 inches of bad soil, it would take 160 bushels for a bad soil 12 inches thick. But it has been found that an uncultivated bog near the plantation of N. H. Bishop, Manahawkin, N. J., which was 6 feet thick, was nearly devoid of sulphureted-hydrogen odor and acid condition, and, with the bountiful supply of water at command, irrigation and sanding would supply all the elements necessary to successful cultivation.

The black sand of the cranberry-lands of New Jersey contains about $2\frac{1}{2}$ per cent. of vegetable matter. Where this is present no lime should be used, at least on the high lands, but irrigation is always necessary. The report of the New Jersey State Board of Agriculture for 1875, page 28, gives an analysis of nine varieties of soil of that State, consisting of gneiss, magnesian, slate, red shale, marl, soil of drift of South Jersey, soil of alluvium, sea-border, and soil of the tide-marshes. The organic matter contained in these soils is, respectively, 6.89, 5.52, 5.12, 7.45, 12.56, 1.90, 1.61, 4.14, 7.45 per cent. But the soil of the cranberry-bogs on which lime has been applied at the rate of 40 bushels to the acre is composed wholly of vegetable matter. In the same report, page 53, appears the following statement of an experiment made with lime by David Petit, esq., Salem, N. J.:

About twenty-five years ago I had a field of the outcropping of the middle green-sand marl-bed covered with Pennsylvania slaked lime, 100 bushels to the acre, before seeding with wheat. I was advised not to do so, that it would injure the crop, for lime applied directly to the wheat-crop would prevent its ripening and cause it to rust. But the land being of a dark color and early, the crop was good, without rust, and I had a good stand of young grass; but the next year the action of the lime with or upon the marl (although it was the poor outcropping) was strong on the young clover—gave it such an impetus in growth that it shot up above the timothy, then fell, and smothered it out long before mowing time.

It is stated by William G. Woodnut, page 54, that he used 900 bushels on one-third of an acre for a compost for low meadow to great advantage. He says:

Nine hundred bushels on one-third of an acre will make nearly 17 bushels to the rod, which will cover the land an inch deep. If the land was plowed 6 inches deep it would make the compost one-seventh lime. The result of the compost when applied to the lower meadow was very satisfactory.

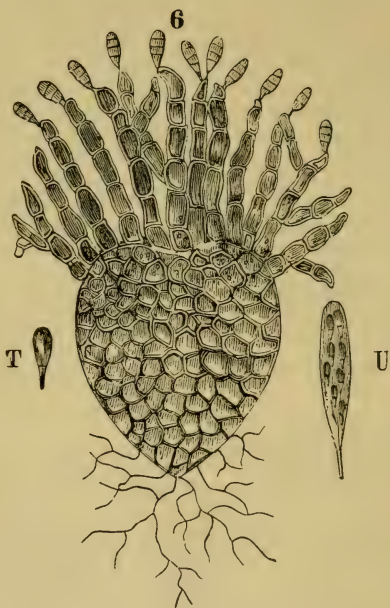
The president of the West Jersey Agricultural and Horticultural Association, Salem County, page 55, says:

Our farmers are using lime freely. * * * The quantity used per acre is from 40 to 60 bushels of slaked lime. * * * Many use it thus: The strips of land where the lime lay in rows were plowed, lime and sod, under together. *No result here till after years.* In fact its use seemed narrowed down to this—get the lime on.

William Statesir, esq., of Freehold, writes, page 56, that he uses 75 bushels to the acre with advantage.

We have evidence that in the Connecticut River Valley from 200 to 300 bushels to the acre have been used with advantage. In this valley, doubtless, a large amount of organic matter is deposited yearly, and in this case a large amount of lime may be profitably used. In the nine cases of analysis given, the organic matter in the respective soils varies from 1.90 to 12.56 per cent., the whole giving an average of about 5.84 per cent. The farmers use from 40 to 100 bushels to the acre with advantage. Now the cranberry bogs will average, probably, 18 inches of soil composed almost wholly of organic matter. If, then, 75 bushels are required to the acre containing 5.74, say 6 per cent., of organic matter, how much should a cranberry-grower use whose peaty soil contains 75 per cent.? It would require $937\frac{1}{2}$ bushels to the acre to equal that used by the New Jersey farmer; but as a large portion of the soluble lime would be washed away annually by irrigation, 1,000 bushels per acre would scarcely equal the farmer's application of 40 or 50 bushels.

But, fortunately, these calculations do not apply to all cranberry lands, since some require little or no lime, and, as stated in a former report on this subject, the use of lime in some cases would be injurious.



Irrigation and heavy sanding are all that is required in many cases for the improvement of the soil and correction of acid. Each cultivator must be the judge as to the quantity of lime and irrigation required, guided by the condition of the roots of the vines and the state of the soil.

The investigations made by the Department of Agriculture will lead, in all probability, to better selections of land for this culture in the future.

Mr. H. A. Green, of Atco, N. J., June 5, 1876, forwards to this Department several sheets of natural paper which grow on his cranberry bogs. This paper consists wholly of the mycelium (spawn) of a fermenting fungus, demonstrating that the peaty matter of his bog needs liming and irrigation; and no stronger proof could be advanced in favor of the expressed views of the Department in relation to cranberry rot, and the value of its investigation, than the growth of these matted sheets on the flooded bogs.

BLACK KNOT.—In the bulletin of the Bussey Institution for 1876, p. 449, the following statement is made:

The best and, so far as we know, the only correct statement of the etiology of the black knot was made by Mr. C. H. Peck, who, as we have already remarked, was the first to describe the conidial state of the fungus. He also first showed definitely when the ascospores ripened, and correctly reasoned that the knot was caused by the *Sphæria morbosa*, and that the fungus on plums and cherries was the same.

In a letter written by Mr. Peck, dated February 16, 1874, and addressed to Dr. Vasey, botanist of this Department, the following paragraph appears:

Mr. Taylor, microscopist of your Department, in his article on black knot, has demonstrated one fact of which I am glad, though I fear he has done it unwittingly. His Fig. 6 shows conclusively the connection between the *Cladosporium* and the *Sphæria*—a connection which I long suspected, and to which I refer in my papers on this subject.

And, in a letter addressed to Mr. Taylor, dated Albany, March 9, 1874, Mr. Peck says:

I am much interested in your investigation of the black knot, and thank you for your favor of the 6th instant.

The chief part of the excrescence is, without doubt, made up of the tissues of the host-plant, as shown by your specimens; and this unusual development of the tissues must have a cause, which I believe should be sought in the irritating or stimulating influence of the mycelium of the fungus. This need not necessarily permeate the whole mass, for it is well known that the egg of an insect deposited in the tissues of plants sometimes causes an excrescence very many times larger than itself. Dr. Vasey kindly sent me the Report of the Department of Agriculture for January, and I was glad to see that your Figs. 5 and 6 show the actual connection between the *Cladosporium* and flocci, * * * a connection which I had long suspected, but had never actually detected. These flocci often bear spore-like bodies, as represented by Fig. 6, which, in such cases of dimorphism, generally disappear by the time the true spores are perfected. Doubtless the specimen you figure was young, or, for some reason, sterile. You will find the real spores of the *Sphæria* in sacks, included in the perithecia, and appearing as in Figs. T and U.

FACTS FROM VARIOUS SOURCES.

THE COTTON MOVEMENT.—The crop of last year is mainly marketed between September 1 of a given year and the same date of the next. The National Cotton Exchange has made its statement of the commercial operations of the cotton year. The aggregate amount of cotton in

sight during the past year, including estimate of southern consumption, and of such transportation as could not be fully recorded, is 4,632,313 bales, an increase of 804,468 over the movement of the previous year. This is an increase of 17 per cent. The following is the statement of the net receipts at the ports :

	1875-'76.	1874-'75.
New Orleans.....	1,424,003	993,462
Galveston.....	465,529	354,927
Mobile.....	374,672	320,822
Charleston.....	396,417	412,931
Savannah.....	524,720	606,727
Wilmington.....	84,042	76,601
Norfolk.....	468,185	387,279
Baltimore.....	18,724	18,512
New York.....	219,654	179,163
Boston.....	73,327	39,885
Philadelphia.....	53,823	39,339
Providence.....	17,415	6,614
City Point, Richmond.....	30,036	32,385
Port Royal.....	23,529	27,912
Indianola.....	17,924	12,754
Other ports.....	3,671	358
Total.....	4,195,671	3,509,691

Adding to this total the estimate of overland shipments to manufacturers, 305,327 bales, and estimated southern consumption, 131,315, the total movement (called erroneously the "total crop" in commercial parlance) is made 4,632,313 bales. The average weight is made 469.67 pounds, making the aggregated pounds, 2,175,678,045.

The sea-island cotton movement, by States, is reported as follows :

Receipts at Savannah.....	5,036	
Receipts at Charleston direct.....	2,482	
Receipts at New York.....	80	
Shipped to foreign ports from Florida direct.....	.....	
Total sea-island, Florida.....		7,598
Receipts at Savannah.....	7,172	
Deduct: Received from Florida.....	5,036	
Received from Charleston.....	.....	
Received from Beaufort.....	15	
	5,051	
Total sea-island, Georgia.....		2,121
Receipts at Charleston.....	8,188	
Receipts at Port Royal.....	435	
Beaufort shipped to Savannah.....	15	
	8,636	
Deduct: Received from Florida direct.....	2,482	
Received from Florida via Savannah.....	1,434	
	3,916	
Total sea-island, South Carolina.....		4,722
Received at Galveston.....	74	
Total, Texas.....		74
Total sea-island crop.....		14,515

Averaging 323.5 pounds per bale.

TRIAL OF WHEAT-SEED.—Mr. J. B. Armstrong, of Wicomico County, Maryland, from an ounce of Fultz wheat, sown in drills, obtained 84 ounces of wheat, and 76 ounces from an ounce of Clawson. The moles destroyed some of the later, or it would probably have equaled the yield of the Fultz. The Clawson has a very strong straw and stands up well

while growing. Mr. L. M. Wilson, of same county, obtained 2 bushels of fine white, flinty wheat from $1\frac{1}{2}$ pints of Clawson.

CROPS IN ASHTABULA COUNTY, OHIO.—According to the assessors' reports the farmers of Ashtabula, Ohio, raised 94,784 bushels of wheat from 8,120 acres; 2,240 bushels of rye from 275 acres; 4,475 of buckwheat from 349 acres; 556,988 of oats from 17,159 acres; 809 of barley from 51 acres; 443,202 of corn from 12,083 acres; 558,891 of potatoes from 5,286 acres; 58,187 tons of timothy-hay from 55,362 acres; 1,033 tons of clover-hay and 93 bushels of clover-seed from 693 acres; 15,000 pounds of flax and 536 bushels of flax-seed from 43 acres; and 4,450 pounds of tobacco from 2 acres. The number of acres plowed for manure was 41; acres in vineyard 72, producing 145,100 pounds of grapes and 1,376 gallons of wine; sweet-potatoes raised, 37 bushels; butter made, 1,058,072 pounds; cheese, 5,557,172 pounds; sorghum-molasses, 83 gallons; maple-molasses, 8,834 gallons; maple-sugar, 236,740 pounds; acres in orchard 5,359, producing 94,402 bushels of apples, 258 of peaches, and 583 of pears; total number of acres in farms, 319,197, of which 102,814 were under cultivation, 142,408 in pasture, 70,450 in forest and 3,525 waste lands. Wool shorn, 98,869; sheep killed by dogs, 255, worth \$1,046; sheep injured, 160; the aggregate injury being estimated at \$380, making a total damage of \$1,426; a tax upon the farming interest enforced by the toleration of 1,934 dogs in the county.

TREE-PLANTING.—A correspondent in Livingston, Illinois, reports that the planting of trees in groves and shelter-belts, and for ornamental purposes, has become very general in that county. Ten years ago 95 per cent. of the area of the county was treeless; but now a farm without a grove is an exception to the general rule. Black-walnut has the preference for profit and ease of cultivation; but elm, soft maple, willow, cottonwood, European larch and ash are common, while evergreens are popular for ornamental purposes, and occasionally are planted in groves and shelter-belts.

AGRICULTURAL STATUS OF MONROE COUNTY, VIRGINIA.—Mr. B. B. Gwinn, president of the Indian Creek Farmers' Club, makes a report to the Department, for this county, from which the following is condensed: A wheat-crop above average in yield and of extra quality has been harvested in good condition. A fair oat-crop has been secured. Corn has been shortened by drought. An abundant hay-crop of superior quality has been harvested without injury. The prospect for fall pastures is good, and all kinds of stock are thriving, except sheep, which have suffered greatly from the excessively hot weather.

A NEW AND LIMITLESS OUTLET FOR AMERICAN BEEF.—In our Monthly Report for June, page 203, under the head of "Fresh beef in London from the United States," is a paragraph describing the conditions under which fresh beef, in quarters, had been safely transported across the Atlantic in the winter-months. Subsequent advices report that the newly-discovered and patented process of preserving without any chemical appliances, and transporting unimpaired, fresh beef by simply suspending it in an atmosphere from which moisture is expelled and kept at a uniformly cool temperature, proves equally successful in the hottest weather. The *Agricultural Gazette*, speaking with reference to the London market, states:

As we are now in receipt of an average weekly supply of some 400 tons of American beef, which, after being killed and packed about fourteen days in extreme hot weather,

arrives quite sound, we may reasonably expect in the winter a very much larger supply. The herd and flock masters of England will perceive that it is always possible that the impossible may happen. An unexpected revolution in their industry suddenly bursts upon them. The English meat market, that appeared a monopoly able to defy all competition, is in a moment dispersed, and the market thrown open to the productions of the wide, interminable pastures of the New World.

A correspondent of the Gazette indorses its frequent commendations of American beef, and states that in spite of the extreme temperature of the week ending August 19, meat from the western part of the United States in the shambles at Newgate was in as perfect condition as that sent up from Leicester or York. In fact, it was in finer order, having "ripened" during the fourteen days since it was slaughtered. The development of this trade astonishes the English people. The first trial cargo arrived at Liverpool last Christmas, and its reception by the British meat-consumers caused a rapid enlargement of the trade which has failed to meet the increasing demand on account of the necessary delay in fitting up the holds of vessels for its transportation. This American meat compares favorably with that of English production, much of which, according to the aforesaid correspondent, is of inferior quality. A great deal is artificially fed, producing an under-proportion of fat and lean from the use of oleaginous foods. Such meat will not be able to compete with the American grass-fed bullocks.

KENTUCKY AGRICULTURAL STATISTICS.—Hon. W. J. Davie, State commissioner of agriculture of Kentucky, reports that the month of August was remarkably favorable to vegetation, high temperature being tempered with abundant rains. Intelligent efforts at fertilization are prosecuted in different parts of the State, and in the breeding of farm-animals Kentucky holds the first rank in regard to horses and mules, if not in cattle, hogs, and sheep. Fruit, vineyard, and garden culture are rapidly advancing, and dairying is becoming an important industry. The corn-crop is estimated at 15 per cent. above average, with a large surplus of last year's crop still on hand. Wheat is better in quality than in any previous year since the war, but is short in quantity from a heavy deficiency in the blue-grass region and the Ohio River counties above Salt River. The Fultz stands highest among the new wheats cultivated, being hardy, stiff-strawed, and midge-proof, and yielding good flour. Barley is full average, and rye 10 per cent. below. Rust has cut the oat-crop to 40 per cent. below average. Blue-grass was short but vigorous, and other grasses were in good supply. Tobacco-plants were injured in the spring by the plant flea and fly, necessitating an extensive resowing of the beds about May 1, and greatly delaying the planting of the crop, and bringing them in an immature state under the blistering heats of July. Bottom crops were "drowned out," and others badly "frenched." Other injurious influences co-operated to reduce the estimate of 75 per cent. of an average the 1st of July to 66 per cent. August 1, and to 55 per cent. September 1. The best stands and prospects were in the Ohio River counties above Louisville, where the "cutting"-leaf is raised. Here the crops will be above two-thirds of an average. In the interior counties, where the "shipping"-leaf is grown, they promise but little over a third of a crop. Potatoes are about 10 per cent. above average.

OUR FOREIGN TRADE.—The Bureau of Statistics of the Treasury report the following in regard to our foreign trade for two years ending June 30, 1876:

MERCHANDISE AND THE PRECIOUS METALS.

	1876.	1875.
Domestic exports.....	\$644,956 406	\$643,094 767
Re-exports of foreign imports.....	21,270 035	22,433 624
Total exports.....	666,226 441	665,528 391
Imports.....	476,677 871	553,906 153
Excess of exports.....	189,548 570	111,622 238

THE PRECIOUS METALS.

Domestic exports.....	\$50,038 691	\$83,857 129
Re-exports of foreign imports.....	6,467 611	8,275 013
Total exports.....	56,506 302	92 132 142
Imports.....	15,936 631	20,900 717
Excess of exports.....	40,569 621	71,231 425

MERCHANDISE.

Domestic exports.....	\$594,917 715	\$559,237 638
Re-exports of foreign imports.....	14,802 424	14,168 611
Total exports.....	580,114 291	545,069 027
Imports.....	460,640 190	533,005 436
Excess of exports.....	119,474 101	12,063 581

These figures are the exponents of a healthy progress. Our exports of merchandise increased \$35,680,077, or $6\frac{1}{2}$ per cent., while our imports fell off \$172,365,246, or 32 per cent. That is, our home production, after meeting an increased home demand, found an increased foreign market for its surplus. The balance of our export-trade increased over \$100,000,000. Our net export of precious metals fell off nearly one-half, and now amounts to about half of our home production. The latest estimates, based upon the returns of gold and silver transportation companies, show that the gold product of 1875 was about the average of the last ten years, or over \$26,000,000, while the silver product has enlarged, making the product of both metals for 1875 over \$80,000,000. The product of 1876 is expected to reach \$90,000,000.

Among the leading articles of agricultural exports, the value of domestic animals fell from \$2,672,555 in 1875 to \$2,436,287 in 1876; breadstuffs rose from \$111,458,265 to \$131,181,555; cotton and its manufactures from \$194,710,507 to \$200,382,240; bacon and hams rose from \$28,612,613 to \$39,664,456; pork rose from \$5,671,495 to \$5,744,022; cheese fell from \$13,659,603 to \$12,270,083; lard, from \$22,900,522 to \$22,429,485; refined sugar rose from \$2,585,382 to \$5,552,587; tobacco-leaf fell from \$25,241,549 to \$22,737,383.

DIVIDING UP RANCHOS IN CALIFORNIA.—A San Francisco journal notes with satisfaction the disposition of large land-owners to part with their surplus acres. This policy has been especially pursued in the southern counties, especially in Tulare and Kern. Here farms with from 80 to 160 acres have combined to secure the best system of irrigation yet adopted on the Pacific slope. Two or three owners of large Mexican land-grants in Santa Clara and Salinas valleys lately divided their surplus land into tracts ranging from 40 to 160 acres. This example is about to be followed by others, and the actual reduction of farms is becoming a settled policy.

WHEAT-CULTURE IN TENNESSEE.—Our statistical correspondent in Rutherford County, Mr. J. H. Crichlow, last year furnished the Depart-

ment with an elaborate and valuable tabular statement of wheat-growing in his county. The same writer has furnished us with a similar statement, embracing a larger acreage and more numerous cultivators. Last year his tables embraced 137 wheat-cultures and 2,721 acres, yielding 33,404 bushels, an average of $12\frac{1}{4}$ bushels. This year the tables include 143 cultures and 3,079 acres, producing 28,646, or $9\frac{1}{3}$ bushels per acre, a marked decline from the results of last year. This decline is attributed almost entirely to the rust. The quality of the crop is greatly in advance of last year. A noticeable feature in this year's crop is the absence of smut, a fact probably due to the free use of blue-stone.

Of the different varieties of seed, the Walker was preferred in 37 cases; the Mediterranean and the Tappahannock or Boughton, each, in 30 cases; the Reed wheat, in 14; the amber, in 10; the white-bearded, in 8; the Fultz, in 6; the Odessa and golden chaff, in 3 each; the Missouri and Genesee, in 1 each. The largest tract cultivated contained 136 acres; the smallest, one acre; the average, 20.83 acres. The maximum yield was 25 bushels of Mediterranean per acre on 6 acres, on upland soil, from which a crop of millet had been gathered. The next best crop, 1 acre of Fultz, yielding $22\frac{1}{2}$ bushels, also followed the millet. In over three-fourths of the cases the wheat-crop followed corn or corn and cotton. The crops reported were almost exclusively grown on upland soil, only 6 being on bottom and 1 on second bottom. Smut appeared in 29 cases, but in some of these it is barely mentionable.

Parties growing.	Variety.	Amount sown per acre.	Number of acres.	Yield per acre.		Total.	Kind of soil.	Preceding crop.	Smut or no smut.	Soaked or not in blue-stone solution.
				Bushels.	6 $\frac{1}{2}$	Bushels.				
James M. McCulloch.....	Mediterranean.....	1	30	6 $\frac{1}{2}$		200	Upland.....	Corn.....		
George Webb.....	Tappahannock.....	1	14	8 $\frac{1}{2}$		131	do.....	Cotton.....		
W. R. Leebetter.....	Fultz.....	1	60	15		900	do.....	Corn and cotton.....		
W. B. Drumright.....	Mediterranean.....	1	6	8		48	do.....	Oats.....		
S. R. Sanders.....	do.....	1	18	14		252	do.....	Corn.....		
Do.....	do.....	1	5	14 $\frac{1}{2}$		72	do.....	Cotton.....		
R. E. Jorman.....	Tappahannock.....	1	40	11		440	Bottom and upland.....	Corn and cotton.....		
W. N. Neal.....	Mediterranean.....	1	30	5		150	Corn.....	Corn.....		
S. H. Singleton.....	do.....	1	31	9 $\frac{1}{2}$		294	Upland.....	Cotton.....		
Lytle Sanders.....	do.....	1	11	12		132	do.....	Wheat.....		
D. M. Leatherman.....	Walker.....	1	30	13		390	do.....	Cotton.....		
J. M. Leatherman.....	do.....	1	30	12 $\frac{1}{2}$		350	do.....	do.....		
Spencer Watkins.....	do.....	1	90	10 $\frac{1}{2}$		297	do.....	do.....		
Lafayette Burrus.....	Mediterranean.....	1	40	14		330	do.....	Corn and cotton.....		
D. P. Perkins.....	do.....	1	65	8		520	do.....	Corn.....		
R. S. Donnell.....	Walker.....	1	50	8 $\frac{1}{2}$		425	do.....	do.....		
J. R. Mathis.....	Tappahannock.....	1	12	7		84	do.....	do.....		
J. A. Moore.....	Mediterranean.....	1	41	13		553	do.....	Open.....		
Joseph Tansom.....	Boughton.....	1	135	11		1,496	do.....	Cotton.....		
E. Rauldolf.....	Mediterranean.....	1	41	12		492	do.....	Wheat and cotton.....		
J. P. McAdoo.....	Walker.....	1	8	14		68	do.....	Corn.....		
S. L. McAdoo.....	do.....	1	60	7 $\frac{1}{2}$		440	do.....	Corn and cotton.....		
B. W. Henry.....	Odessa.....	1	100	7 $\frac{1}{2}$		750	do.....	Wheat.....		Soaked.
William Shanklin.....	Boughton.....	1	15	13		195	do.....	do.....		Do.
Tom Wells.....	do.....	1	35	14		490	do.....	No smut.....		Do.
John Nelson.....	Walker.....	1	21	5		105	do.....	Wheat and corn.....		Do.
Payette Wood.....	Mediterranean.....	1	40	5		200	do.....	Corn and cotton.....		Do.
Maek Johnson.....	Reed.....	1	10	8		80	do.....	do.....		Do.
Lee Howland.....	Walker.....	1	5	6		30	do.....	Corn.....		Do.
Jo Dill.....	Reed.....	1	25	8		224	do.....	Cotton.....		Soaked.
J. H. Borton.....	do.....	1	6	9		54	Second bottom.....	Corn.....		
C. S. Dillon.....	do.....	1	35	10		350	Upland.....	Corn and cotton.....		
John Dillon.....	Walker.....	1	20	7 $\frac{1}{2}$		150	do.....	Corn.....		
Sam Kerr.....	Reed.....	1	35	9		315	do.....	Corn and oats.....		
Silas McHenry.....	do.....	1	6	7 $\frac{1}{2}$		54	do.....	do.....		
John Domet.....	do.....	1	42	7 $\frac{1}{2}$		325	do.....	do.....		
Mrs. D. Crouse.....	do.....	1	40	7 $\frac{1}{2}$		294	do.....	do.....		
F. M. and J. W. Overall.....	White-bearded.....	1	12	9 1 1 6		110	do.....	do.....		
John Brown.....	Walker.....	1	10	9		90	do.....	do.....		
John F. Brown.....	do.....	1	50	6 $\frac{1}{2}$		325	do.....	do.....		
	do.....	1	9 $\frac{1}{2}$	11		104	do.....	do.....	No smut.....	Soaked.

Parties growing.	Variety.	Amount sown per acre.	Number of acres.	Yield per acre.	Total.	Kind of soil.	Preceding crop.	Smut or no smut.	Soaked or not in blue-stone solution.
R. F. Phillips	Reed	Bushels.	92½	Bushels.	Bushels.	Upland	Corn and cotton	No smut.	Soaked.
William Elrod	do	1	8	10	225	do	do	do	do
W. M. T. Reeves	Walker	1	35	94	78	do	do	do	do
R. T. Knox	do	1	15	94	332	do	Corn	Some smut.	do
W. B. White	do	1	29	174	135	do	do	do	do
Rev. J. Warren	Mediterranean	1	15	8	330	do	do	No smut.	do
M. F. Harris	Golden-chaff	1	6	15	90	do	do	do	do
S. E. Smith	Walker	1	8	20	161	do	Cotton	do	do
Henry McHenry	do	1	7	11	77	do	do	do	do
Mrs. M. Hill	Mediterranean	1	16	6	96	do	Corn	Some smut.	Soaked.
John Hill	Walker	1	12	6½	78	do	do	do	do
L. Allen	Mediterranean	1	4	3	12	do	do	No smut.	Soaked.
Brown & Bruce	Reed	1	24	7½	180	do	Corn and cotton	do	do
J. E. Smith	Walker	1	15	9	135	do	do	do	do
R. T. Smith	do	1½	6	12	72	do	Cotton	do	do
Albert Smith	Reed	1	15	8	120	do	Corn and cotton	do	do
E. H. Delbridge	Mediterranean	1	10	7½	75	do	Corn	do	do
James Vaugh	Boughton	1	8	9	64	do	do	do	do
T. K. McCrea	Mediterranean	1	10	7½	75	do	do	do	do
Tom McClaren	Boughton	1	5	11½	58	do	do	do	do
J. L. Vaughn	do	1	6	6½	40	do	do	do	do
A. J. Lone	Tappahaunock	1	10	7½	75	do	do	Some smut.	do
R. H. Vaughn	Walker	1	29	11½	225	do	do	do	do
J. R. Vawter	Mediterranean	1	5	21	105	do	Clover	No smut.	Soaked.
Porsley & Ryan	Amber	1	6	6½	39	do	Corn	do	do
John W. Ryan	do	1	10	16	160	do	do	do	do
B. P. Ryan	do	1	5	11	55	do	do	do	do
M. Ryan	do	1	12	6	72	do	do	do	do
J. A. Maxwell	Mediterranean	1	10	12½	125	do	do	do	do
William Haynes	Missouri	1	4	34	13	do	do	Some smut.	do
H. D. Snel	Mediterranean	1	9	7½	68	do	do	No smut.	do
William Jones	Boughton	1	6	9½	56	do	do	Some smut.	do
A. Burkhardt	do	1	3	5½	16	do	do	do	do
Henry Edwards	do	1	5	7	35	do	do	do	do
Fred. Delbridge	Amber	1	5	6	30	do	do	do	do
Tom Haynes	do	1	7	6	42	do	do	No smut.	Soaked.
Everett Haynes	Walker	1	15	7	105	do	do	do	do
W. C. Henry	Mediterranean	1	10	11	110	do	do	do	do
Wade & Hunt	Amber	1½	60	6	360	do	Corn and cotton	do	do
G. S. Harding	Boughton	1	30	9 1-6	275	do	do	do	do

Dr. J. L. Bedford	Walker	1	12	7	84	do	Corn	do	Do.
J. M. Haynes	Boughton	1	20	15	300	do	Wheat and oats	do	Do.
Joseph Hollowell	Mediterranean	1	20	114	230	do	Cotton	do	Do.
Do	Walker	1	10	107	105	do	do	do	Soaked.
William Roberts	Boughton	1	15	74	110	do	Open	do	Do.
Do	Amber	1	12	66	80	do	Cotton	Some smut.	Do.
Jack Todd	Mediterranean	1	16	8	138	do	Corn	No smut.	Soaked.
W. J. Hooper	Walker	1	25	8	200	do	Corn	Some smut.	Soaked.
E. B. Wade	Fultz	1	25	23	213	do	Corn	No smut.	Do.
G. W. Matthews	Odesa	1	10	9	90	do	Cotton	do	Do.
E. L. Matthews	do	1	30	8	240	do	Corn	Some smut.	Do.
John Matthews	Boughton	1	5	9	45	do	Cotton	Some smut.	Do.
D. F. Elam	Mediterranean	1	16	12	192	do	do	do	Do.
A. B. Jones	White-bearded	1	55	94	323	do	Corn and cotton	No smut.	Soaked.
James Dillon	do	1	10	174	175	do	Cotton	do	Do.
H. H. Bradley	Boughton	1	30	14	420	do	Corn	do	Soaked.
A. P. Lowe	White-bearded	1	15	20	335	do	Wheat	do	Do.
S. J. Cobb	Boughton	1	27	54	300	do	Open	Some smut.	Do.
J. P. Hooker	Walker	1	35	16	560	Bottom	Corn	No smut.	Do.
J. W. Neale	Walker	1	40	74	300	Upland	Wheat	do	Do.
J. M. Baird	Walker	1	80	8	640	Upland	Corn and cotton	do	Do.
A. P. McAdoo	do	1	25	5	105	do	Cotton	do	Do.
Samuel Donnell	Fultz	1	35	13	466	Bottom	Corn	do	Do.
T. J. Wade	do	1	10	10	100	Upland	Corn and cotton	Some smut.	Soaked.
F. M. Arnold	Walker	1	12	16	200	do	Corn	No smut.	Do.
Reuben Herrod	do	1	42	74	315	do	do	do	Do.
Willis Lauford	Golden chaff	1	20	8	160	Bottom	do	do	Do.
Do	White-bearded	1	20	8	160	do	do	do	Do.
Favor Cason	Reed	1	20	8	160	do	do	do	Do.
J. E. Granstaff	White-bearded	1	42	74	315	do	do	do	Do.
Do	White-bearded	1	20	8	160	do	do	do	Do.
Do	Boughton	1	10	84	85	Upland	do	do	Do.
R. M. Rucker	Walker	1	30	10	390	do	Clover and Corn	Some smut.	Soaked.
J. N. Loughry	do	1	25	34	138	do	Corn	No smut.	Do.
W. P. Henderson	Tappannauck	1	27	74	196	do	Corn and cotton	No smut.	Soaked.
Do	Fultz	1	1	224	23	do	German millet	Some smut.	Soaked.
I. S. Webb	Fultz	1	20	94	190	do	Corn	No smut.	Do.
Do	do	1	5	14	70	do	do	do	Do.
Jos. Irby	Walker	1	30	10	300	do	Cotton	do	Do.
C. Beesly	Walker	1	8	10	80	do	Corn	Some smut.	Do.
John Beesly	do	1	15	10	150	do	Corn and cotton	do	Do.
W. L. Patterson	Mediterranean	1	6	25	150	do	Millet	No smut.	Do.
Dr. W. Whitson	Genesee	1	40	8	320	do	Corn	do	Do.
Frank Fletcher	Walker	1	40	9	360	do	do	do	Do.
Martin & Ellis	do	1	25	11	275	do	Corn and millet	Some smut.	Soaked.
W. H. Smith	Golden chaff	1	30	12	360	do	do	No smut.	Do.
W. S. Rhodes	White-bearded	1	28	12	336	do	do	do	Do.
J. T. Smith	Reed	1	28	12	336	do	do	do	Do.
W. N. Jordan	Boughton	1	9	94	273	do	Cotton	Some smut.	Soaked.
Do	do	1	5	54	45	do	do	No smut.	Do.
L. H. House	Mediterranean	1	14	9	126	do	Corn and cotton	do	Do.
Do	do	1	7	9	63	do	Cotton	do	Do.

Parties growing.	Variety.	Amount sown per acre.	Number of acres.	Yield per acre.	Total	Kind of soil.	Preceding crop.	Smut or no smut.	Soaked or not in blue-stone solution.
		<i>Bushels</i>		<i>Bushels.</i>	<i>Bushels.</i>				
L. H. House.	Tappahannock.	1	9	11	66	Upland.	Corn.	No smut.	Soaked.
Do.	Amber.	1	7	10	70	do.	do.	do.	Do.
W. A. Jones.	Boughton.	1	11	7 $\frac{1}{2}$	82	do.	do.	do.	Do.
Do.	Mediterranean.	1	4	11	44	do.	do.	do.	Do.
Hillman & Minor.	Boughton.	1	85	6	510	do.	Cotton and oats.	Some smut.	
Dr. J. H. White.	Walker.	1	95	8 $\frac{1}{2}$	213	do.	Corn.	No smut.	Soaked.
W. Arch. Haynes.	Boughton.	1	91	9	192	do.	do.	do.	Do.
T. M. King.	Mediterranean.	1	13	14	98	do.	Cotton.	do.	Do.
Do.	Walker.	1 $\frac{1}{2}$	13	9	117	do.	Corn.	do.	Do.
J. J. Lawing.	Boughton.	1	20	9	180	do.	do.	do.	Do.
Do.	Mediterranean.	1	10	6 $\frac{1}{2}$	65	do.	do.	do.	Do.

BRITISH GRAIN IMPORTS.—From late official returns of the British Board of Trade, it appears that the total import of wheat into the United Kingdom during the first six months of 1876 amounted to 21,702,299 cwt. against 18,986,424 cwt. during the corresponding period of 1875, an increase of 2,715,875 cwt., or 14.3 per cent. All the great wheat-raising countries from which supplies have hitherto been drawn have decreased their quota, while all the smaller grain countries have increased their supplies. The United States, contributing the largest share of the foreign import, decreased her contribution from 11,099,066 cwt. to 10,748,803 cwt., and from over 58 per cent. of the total wheat import to less than 50 per cent. Russia fell off from 3,804,880 cwt. to 3,410,241 cwt., and from 20 per cent. of the total import to 16 per cent. Germany declined from 2,029,830 cwt. to 1,659,830 cwt., and from nearly 11 per cent. to less than 8 per cent. France decreased her import from 258,771 cwt. to 203,505 cwt.; British North America from 582,008 cwt. to 560,989 cwt. On the other hand, the Ottoman Empire, including Roumania, increased from 348,514 to 824,472, and from less than 2 per cent. to nearly 4 per cent. of the total import; Egypt rose from 183,616 cwt. to 898,288 cwt., and from 1 per cent. to nearly 5 per cent. of the total import; British India, from 118,746 cwt. to 1,166,358 cwt., and from 0.6 per cent. to over 5 per cent. of the total import; Denmark from 71,235 cwt. to 248,975 cwt.; Chili from 311,047 to 442,774 cwt.; other countries from 178,711 cwt. to 1,538,720 cwt., and from less than 1 per cent. to over 7 per cent. of the entire import. The increase from Oriental countries is especially remarkable, and is due, at least in part, to increased facilities in transportation.

The aggregate value of the wheat import rose from £9,629,968 to £11,529,304, or nearly 20 per cent. The rate of increase in the value being nearly 50 per cent. greater than that of quantity shows that prices ruled considerably higher in 1876 than in 1875. It is remarkable that the total value of American wheat rose from £5,680,608 to £5,826,036, an increase of 2 per cent., in spite of the decrease in quantity; in 1875 the value of the American import was nearly 60 per cent. of the whole; in 1876 it was a little over 50 per cent. Russia received in 1876 £1,725,002 for her wheat against £1,850,253; Germany fell from £1,084,245 to £945,337; France from £129,735 to £110,110. On the other hand, Denmark rose from £35,893 to £139,200; Turkey from £160,709 to £378,579; Egypt from £87,619 to £400,842; Chili from £160,234 to £231,401; British India from £56,015 to £584,177, or more than tenfold; British North America from £292,916 to £301,328; other countries from £91,741 to £887,292.

In 1875 the average price of the whole import was 10s. 1½d. per cwt. In 1875, American wheat was valued for import at 10s. 7½d. per cwt.; in 1876 at 10s. 10d. per cwt.; Russian wheat rose from 9s. 8½d. per cwt. in 1875 to 10s. 1½d. in 1876; Danish wheat from 10s. 1d. per cwt. to 11s. 2d.; German, from 10s. 8d. per cwt. to 11s. 4½d.; French, from 10s. to 10s. 10d.; Chili, from 10s. 3½d. to 10s. 5½d.; British India, from 9s. 5½d. to 10s. 2d.; miscellaneous countries from 10s. 4½d. to 11s. 5½d. On the other hand, Turkish wheat fell from 9s. 2½d. to 9s. 9½d.; Egyptian, from 9s. 6½d. to 8s. 11d.; British North America, from 10s. 9½d. to 10s. 9½d.

Barley imports, in quantity, fell from 5,660,925 cwt. to 3,551,043 cwt., and in value, from £2,402,220 to £1,440,960, or from 8s. 5¾d. per cwt. to 8s. 1½d. per cwt. Oats declined in quantity from 5,540,930 cwt. to 5,012,236 cwt., and in value from £2,501,536 to £2,106,321, or from 9s. to 8s. 5d. per cwt. Pease declined from 890,546 cwt. to 779,394 cwt.,

and from £411,133 to £355,407; beans from 1,606,834 cwt. to 1,931,873 cwt., and from £743,501 to £812,247.

Of wheat meal and flour imported, increased in quantity from 2,820,698 cwt. to 3,076,345 cwt., and in value from £2,196,086 to £2,434,943; the average per cwt. rising from 15s. 6 $\frac{1}{2}$ d. to 15s. 9 $\frac{1}{2}$ d. Germany increased her import from 327,669 cwt. to 457,622 cwt., and from £265,196 to £375,847, raising her average per cwt. from 16s. 2 $\frac{1}{2}$ d. to 16s. 5d. France fell off in quantity from 1,041,186 cwt. to 598,521 cwt., and in value from £797,892 to £484,115; but her average per cwt. rose from 15s. 4d. to 16s. 2d. The United States raised her quantity from 1,100,802 cwt. to 1,306,246 cwt.; her total value from £800,323 to £974,775, and her average per cwt. from 14s. 6 $\frac{1}{2}$ d. to 14s. 11 $\frac{1}{2}$ d. It is evident that the staple of our export consists of our inferior grades of flour. British North America increased her quantity from 24,758 cwt. to 60,242 cwt.; her total value from £15,812 to £43,880, and her average from 12s. 9 $\frac{1}{2}$ d. to 14s. 6 $\frac{1}{2}$ d. per cwt.

Indian-corn meal, including maizena, decreased in quantity from 5,059 cwt. to 4,735 cwt.; but in value it rose from £6,547 to £9,487.

MOVEMENT OF POPULATION IN FRANCE.—M. Leonce de Lavergne the celebrated French agronomist, in a communication to the *Economiste Français*, finds ominous indications in the French census. The increase of French population has always been slow, but in later decades it has shown signs of ceasing altogether or to be substituted by a positive decline. The languid movement indicated by the census of 1856 almost "took the proportions of a disaster." The rate of increase was slightly enhanced up to the Franco-Prussian war, among the fatal results of which was an excess of 550,000 deaths over births, besides the loss of the populations of Alsace and Lorraine. The year 1872 was more cheerful, its registry showing an unprecedented number of marriages, and an excess of 172,936 births over deaths, the former being 936,000 and the latter 793,064. But this upward movement languished. The *Annuaire de l'Economie politique* for 1873 shows for that year a decrease of 19,636 births and an increase of 51,524 deaths, the former being 946,364 and the latter 844,588, leaving a surplus of only 101,776, or 71,160 less than in 1872, as the natural increase of the population. The departments of Alpes-Basses, Alpes-Hautes, Alpes-Maritimes, Aube, Calvados, Charente, Charente-Inferieure, Côte d'Or, Doubs, Eure, Eure-et-Loir, Gers, Hérault, Indre-et-Loire, Isère, Jura, Lot-et-Garonne, Maine-et-Loire, Marne, Orne, Rhône, Sarthe, Seine-Inferieure, Tarn-et-Garonne, Var, and Yonne report an aggregate excess of deaths of 14,509; the remaining departments show an excess of births of 116,285. These facts, however, indicate no decay in the virility of the French race, but the presence of social conditions unfavorable to marriage, and consequently to the growth of the population. Economic causes have enforced the practice of celibacy upon a large portion of the laboring population, the most prolific portion of the whole.

M. Garnier, an eminent French statistician, takes a more cheerful view of the situation, and from data extending up to 1875 finds an annual augmentation of the population from the excess of births over deaths of 137,356, which he thinks is as great as the productive resources of France, at their present rate of development, will support.

FRENCH IMPORTS OF SPANISH AND ITALIAN WINE.—The French superior council of commerce, agriculture, and industry has been gravely studying some facts ominous to the wine interest of France. Official statistics show that in 1871 Italy took but 53,000 to 54,000 hectoliters

of French wines (1,426,561 to 1,452,979 gallons) against a previous aggregate of 250,000 hectoliters, (6,604,450 gallons,) while the French import of Italian wines has risen from 12,000 hectoliters (317,013 gallons) to 129,000 hectoliters, or 3,407,896 gallons. The Spanish wine-trade presents still more discouraging figures. The French importations from the Peninsula had risen from 179,000 hectoliters (4,728,786 gallons) in 1872 to 541,000 hectoliters (14,292,030 gallons) in 1873 and 559,000 hectoliters (14,767,550 gallons) in 1874. The annual export of French wines to Spain ranged from 6,000 to 8,000 hectoliters, or from 158,500 to 211,350 gallons. In view of this disproportion, the council was unanimous in demanding that the import-duty upon Italian wines be raised to 5 francs per hectoliter, about 3 $\frac{3}{4}$ cents per gallon, for common wines, and 20 francs per hectoliter, or 15 cents per gallon. The cheapness of French wines at home is significantly indicated by the fact that so small a duty is regarded as sufficient for the protection of the home product from destructive competition in the home market.

FOREIGN TRADE OF FRANCE.—During the first half of 1876 the aggregate value of articles imported into France was 1,811,057,000 francs, an increase of 170,573,000 francs, compared with the aggregate of the same period of 1875; the exports amounted to 1,769,646,000 francs, a decrease of 108,536,000 francs. The following imports exhibit an increase: Cereals, from 59,780,000 francs in the first half of 1875 to 94,338,000 francs in the first half of 1876; dried legumes, from 1,735,000 to 5,684,000; wines, from 7,585,000 to 14,667,000; cattle, from 38,900,000 to 53,545,000; butter and cheese, from 14,475,000 to 16,882,000; horses, from 7,447,100 to 11,883,080; silk, from 139,537,008 to 151,972,000; hemp, from 4,680,000 to 7,530,000; wood for construction, from 26,896,000 to 37,598,000. On the other hand, the importation of foreign sugar during the same comparative periods fell from 47,684,000 francs to 45,919,000 francs; wool, from 171,609,000 to 159,835,000; oleaginous seeds and grains, from 42,212,000 to 40,124,000. The following domestic exports show a decided falling off: Grain and flour, from 125,090,000 francs during the first half of 1875 to 67,724,000 during the same period of 1876; farinaceous foods, from 19,960,000 to 18,983,000; table-fruits, from 11,989,000 to 9,281,000; wines, from 133,350,000 to 116,537,000; unrefined sugar, from 24,978,000 to 21,158,000; wool, from 40,172,000 to 33,850,000; eggs and poultry, from 27,309,000 to 24,141,000.

ADULTERATION OF FRENCH WINES.—M. Grandeau, director of the eastern agronomic station of France, has published the results of some official analyses of matters used in the adulteration of French wines. Formerly water, alcohol, and vegetable coloring-matters, such as log-wood, hollyhock, &c., were used. Then extracts of coal-oil were highly successful in imparting high color to wines, but were very injurious to the consumer. Lately, chemical analysis has detected a still more subtle and dangerous material in aniline red, or *fuchsin*, which M. Grandeau found extensively used in coloring Burgundy wines. This substance is obtained by a variety of processes, among the most prominent of which is the reaction of arsenic acid upon aniline in close vessels at a temperature of 190° Fahrenheit. Even when the fuchsin is obtained pure it has a very injurious effect upon the animal economy. But in the process of evolution it absorbs small quantities of arsenious acid commonly called arsenic. It is prepared for use by mixture in sirups or caramels, and is associated with other coloring-matters more or less poisonous. A centimeter (less than one-sixth of a cubic inch) of such preparations will give to a liter (1.05 quarts) of water an intense color. Some wine-makers

in the south of France expend from 10,000 to 12,000 francs in these sirups, at an average of about 2 francs per kilogram. The extent to which these southern houses practice this adulteration was shown by the numerous analyses at Nancy, conducted by Professor Ritter, of the faculty of medicine. It is very likely that the same facts would be revealed by an investigation at other centers of population in France. The proportion of fuchsin, amounting in many of these wines to 0.025 gram per liter, was sufficient to produce organic disturbance in a very few days.

The experiments of Messrs. Ritter and Feltz demonstrate the poisonous character of fuchsin, even when unmixed with arsenic, which of course gravely complicates the difficulty. A stout, healthy, robust man of fifty years swallowed 200 centimeters, or less than one-seventh of a gallon, of wine, containing one-half a gram, or nearly 8 grains, of fuchsin. A quarter of an hour afterward his ears were deeply colored with red; his mouth became pruriginous, (affected with a painful itching sensation;) his alveolar process swelled slightly, with a constant tendency to spit. Two days after the same dose was administered immediately after eating. The coloration of the mucous membranes and of the integuments was less pronounced, but still very perceptible. The patient continued to drink every morning for twelve days a liter of this wine. The coloration of the ears was not so permanent, but the itching of the mouth became more severe. About the eighth day a very uncomfortable scalding sensation was felt at the sides of the ears. On the eleventh day diarrhea supervened, the stools being colored with fuchsin. On the twelfth day very painful colic-cramps were followed by numerous evacuations. The urine was rose-colored during the whole experiment, and after the twelfth day contained albumen. On the cessation of the dose the patient recovered health in two days.

Two series of experiments on dogs brought to light the disorganizing action of fuchsin upon the kidneys. A dose of 0.6 gram (9.25 grains) was daily given to a dog for fifteen days, and the same dose to another dog for eight days. The animals grew thinner and lost weight daily; their urine, colored red, contained albumen, and afterward granulo-fatty cylinders, clearly indicating an alteration in the kidneys. Finally diarrhea came on, when the coloration of the urine diminished, as also the albuminous matter. Both the animals showed itching at the mouth by rubbing their muzzles against the ground; they slavered freely.

The experiment was varied by injecting the fuchsin directly into the circulation. One dog was treated with 0.35 gram, (5.4 grains;) another with 1.71 grams, (16.39 grains,) in three doses; a third with 0.45 gram, (6.84 grains,) in three doses, but all on the same day; a fourth with 1.80 grams, (16.77 grains,) in two doses; a fifth with 0.48 gram, (7.4 grains,) in four days. The mucous membranes and integuments were strongly discolored in all cases; they lost appetite, but drank freely, though without febrile symptoms. The second dog died in ten days after the injection; the fifth in twelve days; the third in twenty-one days; the other two survived the experiment. A post-mortem examination showed all the organs, except the nervous system, colored by fuchsin, which was eliminated through the bile. The surviving animals manifested a degeneracy of the cortical substance of the kidneys, sometimes visible to the naked eye, and easily discernible at any time with the microscope. The proportion of albumen in the urine rose as the symptoms became more decided, ranging from 7 to 33 grams per 1,000; this continued long after the injection.

The evident conclusion from the above facts is that wine colored with fuchsin, even when the coloring-matter is perfectly pure, produces that dangerous disease of the kidneys called albuminuria. M. Grandeau calls for a stringent execution of the law against parties thus tampering with the lives and health of the wine-consuming public. He suggests that honest merchants shall refuse to purchase the adulterated wines; and that they shall expose all manufacturers convicted, by analysis of their wares, of this destructive fraud. The station over which he presides will receive no specimen for analysis except upon condition of exposing the malefactors.

INSUFFICIENT CEREAL PRODUCTION IN GERMANY.—The growing insufficiency of grain-crops to meet home consumption in Germany gives rise to much anxiety in Berlin. According to the Berlin Mercantile Report, the excess of grain imports over exports during the past year were as follows: Wheat, 1,500,000 centners; rye, 11,000,000 centners; barley, 2,133,000 centners; oats and corn, from 2,000,000 to 3,000,000 centners; total, 16,000,000 centners, or about 17,636,800 pounds, valued at \$27,370,000.

This insufficiency, by some, is attributed to economic mismanagement. It is feared that Germany, like other agricultural countries, will soon find her production below her home consumption, a natural consequence of the growing preponderance of other industries. The Berlin National Gazette says:

Of course, the advantages derived herefrom ought to balance the deficiencies mentioned; otherwise the country would, by continually paying in cash the excess of imports of articles of food as well as of manufacture, gradually become impoverished. Many predict this fate for Germany. It is but too true that since the Franco-Prussian war the trade-balance has been anything but satisfactory, and an improvement cannot be looked for in the exports of raw products, notably grain, so much as in that of manufactures. Therefore the turning of our neighbors' attention more particularly to agriculture is a decided advantage to our manufacturing interests.

It is claimed that the increase of acreage is not in proportion to population, and that even a more extensive culture will not meet the increased consumption. Cultivable land in Germany is already quite fully utilized, and agricultural production consequently limited in its increase. The area gained by clearing and reclaiming land does not exceed what is appropriated to manufacturing. Within the last few years railways have taken up several hundred thousand acres.

The raising of grain is becoming less profitable from year to year, and farmers are turning their attention to sugar-beets, tobacco, oleaginous plants, fruits, vegetables, &c. Increase in stock-raising necessitates a more extensive culture of forage-plants. It is said that the area of profitable cultivation has actually decreased, while the cost of labor has advanced.

In a recent work published in Germany on "Feeding and Food for Farm Animals," by Dr. Schmoller, it is asserted that while the production of meat and milk has by no means been commensurate with the increase of population, the wool product has greatly exceeded actual demand. To illustrate this, Schmoller cites for Prussia—

Year.	Number of sheep.	Pounds of wool per sheep.	Total production.	Pounds of wool per capita.
1804.....	10,394,428	1.83	19,096,295	2.07
1816.....	8,260,396	1.83	15,175,723	1.45
1840.....	16,344,018	2.42	39,635,224	2.65
1867.....	18,806,400	2.75	51,830,146	2.62

A further consideration is the improvement in the quality of the wool. In 1804 it sold at 16 to 26 cents per pound; in 1867, 32 to 65 cents.

With these results may be contrasted the following: In Prussia there were for every 100 of population in—

Year.	Horses.	Cattle.	Sheep.	Swine.	Goats.
1802.....	18.0	58.0	122.0	29.0	Not given.
1816.....	11.9	38.6	79.9	14.7	1.3
1840.....	10.8	33.1	108.9	14.9	2.4
1867.....	9.5	30.2	95.5	19.2	5.3

In Saxony, for every 100 of population, there were, in 1763, 197.7 heads of farm animals; in 1834, 83.4; and in 1858, 61.0. Count Lippe has estimated that for this country the present annual increase of meat-consumption is 3,300,000 pounds, which, even if the rate of increase of population be no greater, will in ten years amount to 330,000 cwt.

Prussia had, in 1867, for the same number of inhabitants, only half as many heads of farm animals as in 1802, and an aggravating circumstance is the fact that the quality of the meat does not make up for the proportionate decrease of quantity.

Schmoller gives the consumption of meat *per capita* for 1802, 36.8 pounds; 1816, 24.8; 1840, 38.1; and for 1870, 38.5, while from 165 to 220 per annum are required.

A similar retrogression is observable in other countries. Bohemia, for example, had, in 1870, 1,585,799 head of cattle, which is 13.6 per cent. less than in 1857. The decrease was, bulls, 3.7; cows, 9.4; oxen, 18.2; and calves, 18.5.

With regard to the yield of milk in Prussia, Schmoller says that there is not so much produced *per capita* now as there was in 1802. For this year the daily production was .80 quart; 1816, .72; 1840, .60; and in 1867, .57.

Count Lippe estimates the deficiency of milk and dairy products in Saxony at 62,422,277 gallons, and the yearly increase of demand at 4,238,935 gallons.

THE COLORADO BEETLE IN EUROPE.—M. Adam Müller, secretary of the Bavarian Agricultural Association, in his monthly report for July, 1876, upon the authority of the Weser Gazette, states that a potato-beetle (*Doryphora decem-lineata*) had been found in a sack of corn on board a steamer that arrived at Bremen from New York. This announcement has created great excitement on Continental Europe. M. Grandean, director of the eastern agronomic station of France, through the columns of the Journal Pratique d'Agriculture, calls upon the minister of agriculture to take immediate measures to arouse French farmers to a united effort for the destruction of this terrible enemy.

SWEDISH AGRICULTURE.—Hon. C. Lewinhaupt, Swedish and Norwegian minister, in a communication addressed to the Commissioner, gives the following statistics of Swedish agriculture. This industry occupies half the population, and is under the department of the interior, but the special administration of this trust by the government is confided to an agricultural committee, of which the president of the national agricultural society is chairman. The paid members of this committee are a secretary and twenty agricultural chemists and engineers. In Norway, the department of the interior exercises direct supervision of agriculture, without any intermediate board.

The population of Sweden in 1874 was 2,390,000, of which half were engaged in agriculture. About \$30,000 are annually appropriated to the committee of agriculture, and \$10,000 for forest administration.

AUSTRIAN LIVE-STOCK STATISTICS.—Partial returns from Austrian provinces of the Austro-Hungarian monarchy show the following aggregates of farm animals and their milk-product :

Provinces.	Milk-cows.	Product of milk.	Average product per cow.	Sheep.	Goats.	Milk from sheep and goats.
		Gallons.	Gallons.			Gallons.
Upper Austria.....	243,443	53,971,413	221	135,594	19,562	16,685
Steiermark.....	265,581	79,408,719	299	203,290	38,507	1,868,750
Voradburg.....	33,773	16,941,190	501	17,776	15,471	578,116
Carinthia.....	87,104	22,978,750	264	176,832	36,630	747,500
Carniola.....	79,071	31,920,791	403	55,161	16,555	618,930
Trieste.....	2,839	1,258,790	439	350	115	2,242
Dalmatia.....	27,116	4,992,552	184	903,318	481,114	12,333,750
Moravia.....	321,277	71,760,000	223	323,503	80,383	4,889,750
Silesia.....	112,398	26,019,578	231	73,037	16,012	691,587
Total.....	1,172,602	309,251,783	263	1,909,391	704,289	21,716,310

The aggregate of cow's, sheep's, and goat's milk in the above provinces was 330,934,033 gallons, of which 174,033,278 gallons are consumed without conversion, the city of Trieste purchasing 2,149,436 gallons of the neighboring provinces. The balance, 156,900,815 gallons, is made into butter and cheese, the product of the former being 40,517,792 pounds, and that of the latter 35,679,907 pounds, (not including Carniola.)

The total number of milk-cows in the Austro-Hungarian monarchy in 1872, was officially stated at 3,832,238. In 1875, the number is estimated at 4,000,000, averaging 280 gallons of milk each, and aggregating 1,120,000,000 gallons. In 1872, the whole monarchy had 76,379 steers, 1,224,079 oxen, 2,315,840 calves, 4,255,659 sheep, 1,187,821 goats, and 25,642,301 swine.

ROUMANIAN AGRICULTURE.—Roumania, a nominal dependency of the Ottoman Empire, embraces the old Turkish provinces of Moldavia and Wallachia. It is inhabited by a population of original heterogeneous elements, which have fused into a well-defined type. The ruling element dates its existence from the location of Gallo-Romanic military colonists sent by the Roman emperors to occupy a strong frontier against the incursions of the restless barbarians hanging on the north-east borders of the empire. Of this composite race, there are about 9,000,000 in Southeastern Europe, of whom 5,000,000 are united in the little vassal monarchy of Roumania, with a small admixture of other nationalities. The other Roumanians are scattered through the neighboring provinces of Turkey and Southern Russia.

The province of Roumania has an area of 30,000,000 acres—about the size of the State of Mississippi—bounded by the Danube on the south, by the Pruth on the east, and by the Carpathian Mountains on the north and west. Wallachia embraces about three-fifths and Moldavia two-fifths of the united monarchy. The prerogative of the Crown is limited by parliamentary institutions, after the manner of the limited monarchies of Western Europe. The whole political and social organization is a remarkable development of western ideas amid the crystallized old conservatism of the East.

About four-fifths of the people are engaged in agriculture. The climatic conditions involve great extremes of temperature. The summers are intensely hot and the winters severely cold. The spring is short, the autumn is longer and more pleasant.

The country has been afflicted with destructive droughts for several years past, resulting, as it is believed, from the indiscriminate destruction of the forests. An exhaustive system of culture has also robbed the soil of its surface-elements of fertility, which have not been replaced by manuring. The chief food of the people is *mammaliga*, or corn-meal, and consequently corn constitutes the staple crop of the country. About twice as much land is devoted to its culture as to that of wheat. The failure of the corn-crop, then, involves suffering and starvation to the laboring classes.

A gradual improvement has of late years been noted in the methods of culture. Improved implements and machinery have been introduced, mostly from England. The simplest and least-complicated machines are in request, inasmuch as the Roumanians have developed but little mechanical genius, and find it difficult to make repairs upon a complicated instrument. Till lately grain was almost universally separated from the stalk by trampling the heads with horses, and this practice is still prevalent in the less progressive sections of the country, but the economic value of elaborate implements has shown itself by its superiority of results. As the supply of labor is scanty, this importation of machinery has added greatly to the efficiency of crop-raising in Roumania. Agriculture has also become diversified to some extent, and market-gardening is on the increase, occupying nearly 400,000 acres in 1875—the culture of nearly all kinds of fruits and vegetables grown in Europe. The fruit, through bad management, seldom ripens, and is plucked in its immature state, to be made into preserves and “*dulceas*,” a kind of sweetmeat of which Roumanians are very fond. Viticulture is still in its infancy, and the wines of the country are very unpalatable to those accustomed to the finer vintages of Central and Western Europe. A few brands, however, have acquired some reputation, such as the Colnar, in Moldavia, and the Dragashani, in Wallachia, names derived from the localities of manufacture.

About 5,000,000 acres, or one-sixth of the area of the country, is covered by fine forests, especially occupying the off-shoots and side ranges of the Carpathians. Imperfect facilities of transportation give to these forests so low a value, that no general motive operates to secure their destruction, as in the case of countries nearer to the general markets of the world. They embrace fine timber of every sort—pine, fir, larch, oak, beech, ash, elm, lime, birch, maple, wild cherry, &c. The wood, well seasoned, has a special value in building, being hard and close-grained. These forests are being rapidly depleted on the hill-sides, but on the inaccessible mountain-summits they await a more serious attack. The attention of public men has been called to the effects of the depletion of forest areas, and new efforts are being made to save and enlarge the remnant.

MARKET-PRICES OF FARM-PRODUCTS

FOR AUGUST AND SEPTEMBER, 1876.

The following quotations represent, as nearly as practicable, the state of the market at the opening of each month.

Articles.	August.	September.
NEW YORK.		
Flour, superfine State and western..per barrel..	\$3 60 to \$4 35	\$3 50 to \$4 25
extra State.....do.....	4 40 to 6 50	4 25 to 6 50
extra to choice western.....do.....	4 40 to 9 00	4 30 to 8 50
southern extra.....do.....	4 65 to 5 00	4 50 to 5 90
southern family.....do.....	5 05 to 8 50	6 10 to 8 50
Wheat, No. 1 spring.....per bushel..	1 12 to 1 25	1 05 to 1 20
No. 2 spring.....do.....	94 to 1 12½	98 to 1 10
winter, red, western.....do.....	70 to 1 25	90 to 1 27
winter, amber, western.....do.....	70 to 1 25	90 to 1 27
winter, white, western.....do.....	1 15 to 1 35	1 14 to 1 28
Corn.....do.....	54 to 59	50 to 57
Oats.....do.....	35 to 38	35 to 45
Rye.....do.....	50 to 78	70 to 85
Barley.....do.....	Neglected	Nominal
Hay, baled, first quality, for retail...per ton..	14 00 to 18 00	14 00 to 18 00
baled, second quality, for shipping..do.....	12 00 to 13 00	12 00 to ———
Beef, mess.....per barrel..	9 00 to 11 00	8 00 to 10 00
extra mess.....do.....	10 00 to 12 00	10 00 to 11 00
Pork, mess.....do.....	19 40 to 19 60	16 50 to 16 75
extra mess.....do.....	Neglected	Neglected
prime mess.....do.....	Neglected	Neglected
Lard.....per pound..	11½ to 11½	9½ to 10½
Butter, western.....do.....	13 to 27	14 to 30
State dairy.....do.....	22 to 30	22 to 32
Cheese, State factory.....do.....	6½ to 9½	5 to 10½
western factory.....do.....	6½ to 8½	7 to 8½
Sugar, fair to prime refining.....do.....	8½ to 9½	9 to 9½
Cotton, ordinary to good ordinary.....do.....	8½ to 10½	9½ to 10½
low middling to good middli'g.....do.....	11½ to 12½	11 to 12½
Tobacco, lugs.....do.....	6 to 8	6 to 9½
leaf.....do.....	8 to 15½	9½ to 13½
Wool, American XXX and picklock.....do.....	38 to 40	35 to 42
American X and XX.....do.....	30 to 36	30 to 40
American combing.....do.....	45 to 52	40 to 48
California, spring clip.....do.....	12½ to 24	12½ to 26
California, fall clip.....do.....	10 to 15	10 to 16
pulled.....do.....	25 to 33	20 to 35
BOSTON.		
Flour, western superfine, spring...per barrel..	3 00 to 3 50	3 00 to 3 50
common spring extra.....do.....	4 25 to 4 75	4 00 to 4 75
good to fancy n'hwst'n spring.....do.....	4 75 to 8 50	4 75 to 8 25
good to fancy western winter.....do.....	5 75 to 8 00	5 50 to 7 75
southern family.....do.....	6 50 to 8 00	6 00 to 7 75
Wheat.....per bushel..	83 to 1 35	90 to 1 30
Corn.....do.....	54 to 65	57 to 61
Oats.....do.....	30 to 46	36 to 50
Rye.....do.....	90 to ———	75 to 80
Barley.....do.....	to ———	Nominal
Hay, eastern and northern.....per ton..	14 00 to 20 00	12 00 to 21 00
western choice.....do.....	17 00 to 19 00	17 00 to 19 00

Market-prices of farm-products—Continued.

Articles.	August.			September.		
BOSTON—Continued.						
Beef, mess	\$10 50	to	_____	\$10 50	to	_____
extra mess	12 00	to	_____	12 00	to	_____
family	13 00	to	\$14 00	12 50	to	\$13 00
Pork, prime	19 00	to	19 50	17 00	to	17 50
mess	20 50	to	21 00	17 75	to	18 00
Lard	12	to	12 $\frac{1}{4}$	11	to	11 $\frac{1}{2}$
Butter, New York and Vermont	18	to	24	18	to	25
western	14	to	22	14	to	30
Cheese, New York and Vermont factory	6	to	10	6	to	10
western factory	4	to	9	5	to	9
Sugar, fair to good refining	8 $\frac{3}{4}$	to	9 $\frac{1}{2}$	9 $\frac{1}{2}$	to	9 $\frac{3}{4}$
Cotton, ordinary to good ordinary	8 $\frac{1}{2}$	to	9 $\frac{1}{2}$	9 $\frac{1}{2}$	to	10 $\frac{1}{2}$
low middling to good middling	10 $\frac{3}{4}$	to	12 $\frac{3}{4}$	11 $\frac{1}{2}$	to	13 $\frac{1}{2}$
Wool, Ohio and Pennsylvania	30	to	40	31	to	45
Michigan	28	to	34	30	to	36
other western	27	to	32	29	to	34
pulled	15	to	38	15	to	40
combing fleece	40	to	45	45	to	50
California	14	to	27	14	to	30
PHILADELPHIA.						
Flour, superfine	3 25	to	3 50	3 25	to	3 50
Pennsylvania extra to choice	3 75	to	6 25	3 75	to	6 25
western extra to choice	5 00	to	6 50	5 50	to	6 50
Wheat, white	1 25	to	1 35	1 20	to	1 30
amber	1 18	to	1 22 $\frac{1}{2}$	1 20	to	1 25
red	70	to	1 17	80	to	1 18
Rye	60	to	65	60	to	_____
Barley	55	to	1 05	_____	to	_____
Corn	54	to	60	51	to	57
Oats	30	to	47	29	to	40
Hay, baled, prime	17 00	to	18 00	16 00	to	17 00
common to fair shipping	14 00	to	16 00	12 00	to	15 00
Beef, western mess	6 00	to	8 00	6 00	to	8 00
extra mess	10 50	to	11 00	10 00	to	11 00
Warthman's & Alburger's city fam- ily	13 00	to	13 25	12 50	to	13 00
Pork, mess	21 00	to	21 50	19 00	to	_____
prime mess	17 00	to	17 50	17 50	to	18 00
prime (extra)	17 00	to	_____	17 00	to	_____
Lard	10 $\frac{1}{2}$	to	12	10 $\frac{1}{2}$	to	14
Butter, choice Middle States	28	to	38	26	to	35
choice western	24	to	26	22	to	24
Cheese, New York factory	5	to	10 $\frac{1}{2}$	5 $\frac{1}{2}$	to	10 $\frac{1}{2}$
Ohio factory	4	to	9	4	to	9
Sugar, fair to good refining	8 $\frac{1}{2}$	to	9	9 $\frac{1}{2}$	to	9 $\frac{3}{4}$
Cotton, ordinary to good ordinary	8 $\frac{1}{2}$	to	9 $\frac{1}{2}$	8 $\frac{1}{2}$	to	9 $\frac{1}{2}$
low middling to good middling	11 $\frac{1}{2}$	to	12 $\frac{1}{2}$	11 $\frac{1}{2}$	to	12 $\frac{1}{2}$
Wool, Ohio and Pennsylvania X to XXX	34	to	37 $\frac{1}{2}$	36	to	42
other western	30	to	35	30	to	35
pulled	22	to	36	22	to	36
combing	33	to	45	35	to	50
tub-washed	30	to	40	30	to	42
BALTIMORE.						
Flour, superfine	2 75	to	3 75	2 50	to	3 75
extra	4 00	to	5 50	4 00	to	6 75
family	5 00	to	8 00	5 50	to	7 75
Wheat, red	92	to	1 18	85	to	1 19
amber	1 20	to	1 25	1 22	to	1 25
white	1 05	to	1 22	1 10	to	1 25

Market-prices of farm-products—Continued.

Articles.	August.	September.
BALTIMORE—Continued.		
Rye.....per bushel..	\$0 58 to \$0 63	\$0 54 to \$0 56
Oats.....do.....	30 to 41	31 to 37
Corn.....do.....	44 to 59	40 to 56
Hay, Maryland and Pennsylvania.....per ton..	15 00 to 19 00	12 00 to 16 00
western.....do.....	14 00 to 17 00	to
Pork, mess.....per barrel..	20 50 to 21 00	18 00 to
prime.....do.....	20 50 to	to
extra prime.....do.....	18 50 to	18 00 to
Lard.....per pound..	12½ to 12¾	11½ to 12½
Butter, western.....do.....	13 to 21	15 to 23
eastern.....do.....	12 to 16	16 to 20
Cheese, western factory.....do.....	8 to 10	4 to 9½
eastern factory.....do.....	10½ to 11	5 to 10
Sugar, fair to good refining.....do.....	8½ to 9	9½ to 9¾
New Orleans grocery grades.....do.....	to	to
Tobacco, lugs.....do.....	6½ to 11	6½ to 9
leaf, common to medium.....do.....	9 to 11	9 to 11
Cotton, ordinary to good ordinary.....do.....	to 9¾	to 10½
low middling to good middling.....do.....	10½ to 12	11 to 12½
Wool, tub-washed.....do.....	31 to 33	34 to 37
fleece washed.....do.....	28 to 33	28 to 33
pulled.....do.....	23 to 35	23 to 35
unwashed.....do.....	21 to 23	22 to 25
CINCINNATI.		
Flour, superfine.....per barrel..	2 75 to 3 50	2 75 to 3 50
extra.....do.....	3 90 to 4 25	3 90 to 4 25
family and fancy.....do.....	4 75 to 7 50	4 75 to 6 75
Wheat, winter, red.....per bushel..	85 to 1 05	1 00 to 1 05
hill, (amber).....do.....	to 1 10	1 05 to 1 10
white.....do.....	to 1 10	1 05 to 1 10
Oats.....do.....	20 to 33	20 to 38
Corn.....do.....	40 to 46	40 to 45
Rye.....do.....	45 to 58	45 to 58
Barley.....do.....	40 to 75	60 to 75
Hay, baled, No. 1.....per ton..	15 00 to 16 00	15 00 to 16 00
lower grades.....do.....	8 00 to 12 00	8 00 to 12 00
Pork, mess.....per barrel..	18 75 to 19 25	18 75 to 19 25
Lard.....per pound..	10¾ to 13	10¾ to 13
Butter, choice.....do.....	25 to 28	25 to 28
prime.....do.....	17 to 20	17 to 20
Cheese, prime to choice factory.....do.....	7½ to 8½	7½ to 8½
Sugar, New Orleans, fair to good.....do.....	9¾ to 10¾	9¾ to 10¾
prime.....do.....	10½ to 10½	10½ to 10½
Tobacco, lugs.....do.....	to	to
leaf.....do.....	to	to
Cotton, ordinary to good ordinary.....do.....	7½ to 9	7½ to 9
low middling to good middling, do.....do.....	10 to 11¾	10 to 11¾
Wool, fleece-washed.....do.....	25 to 33	25 to 33
tub-washed.....do.....	25 to 34	25 to 34
unwashed, clothing.....do.....	20 to 22	20 to 22
combing.....do.....	25 to 30	25 to 30
pulled.....do.....	23 to 25	23 to 25
CHICAGO.		
Flour, choice winter extras.....per barrel..	6 25 to 7 25	6 25 to 7 25
common to good winter extras.....do.....	5 50 to 6 00	5 50 to 6 00
spring extras, common to good.....do.....	4 75 to 5 00	4 75 to 5 00
spring extras, choice.....do.....	5 00 to 5 50	5 00 to 5 50
patent spring.....do.....	5 75 to 7 50	5 75 to 7 50
superfines.....do.....	2 50 to 3 00	2 50 to 3 00

Market-prices of farm-products—Continued.

Articles.	August.		September.	
CHICAGO—Continued.				
Wheat, No. 1 spring	per bushel..	_____ to _____	\$1 00 to _____	
No. 2 spring	do.	\$0 88 to \$0 89	91½ to \$0 95	
No. 3 spring	do.	79 to _____	82 to 85	
Rye, No. 2	per bushel..	55½ to _____	55½ to 56	
Barley, No. 2	do.	50 to _____	73 to 78	
Corn, No. 2	do.	45 to 45½	43½ to 43¾	
Oats, No. 2	do.	30½ to _____	32 to _____	
Hay, timothy	per ton..	10 00 to 12 50	11 50 to 12 00	
prairie	do.	7 00 to 10 50	_____ to _____	
Beef, mess	per barrel..	10 75 to 11 00	10 75 to 11 00	
extra mess	do.	11 75 to 12 00	11 75 to 12 00	
Pork, mess	do.	18 42½ to 18 60	16 40 to 16 42	
prime mess	do.	19 00 to 19 25	18 00 to 18 25	
extra prime	do.	14 25 to 14 50	13 50 to 13 75	
Lard	per pound..	10 ⁹ / ₁₀ to 11	9½ to 10½	
Butter, choice to fancy	do.	21 to 25	28 to 26	
medium to good	do.	15 to 18	17 to 20	
Cheese, good to choice factory	do.	7¾ to 9	7¾ to 8¾	
Sugar, New Orleans	do.	_____ to _____	_____ to _____	
Wool, tub-washed	do.	30 to 37	30 to 35	
fleece-washed	do.	25 to 28	28 to 29	
unwashed	do.	15 to 21	15 to 22	
pulled	do.	_____ to _____	_____ to _____	
SAINT LOUIS.				
Flour, winter, common to choice	per barrel..	2 50 to 6 50	2 50 to 6 50	
spring	do.	_____ to _____	_____ to _____	
Wheat, white winter	per bushel..	1 32 to 1 36	1 20 to 1 30	
red winter	do.	63 to 1 30	90 to 1 16	
spring	do.	_____ to _____	_____ to _____	
Oats	do.	24 to 30	25 to 33	
Corn	do.	35 to 43	40 to 43	
Rye	do.	41 to 52	42 to 52	
Barley, fair to choice	do.	_____ to _____	60 to 85	
Hay, timothy	per ton..	13 00 to 17 00	11 00 to 12 00	
prairie	do.	7 00 to 9 50	6 00 to 9 00	
Beef, mess	per barrel..	14 00 to 14 50	14 00 to 14 50	
Pork, mess	do.	19 00 to 20 50	17 25 to 18 00	
Lard	per pound..	9½ to 11	9½ to 11	
Butter, prime to choice dairy	do.	18 to 20	18 to 20	
country packed	do.	13 to 16	13 to 16	
Cheese, Ohio factory	do.	12½ to 13½	12½ to 13½	
New York factory	do.	13 to 14	13 to 14	
Cotton, ordinary to good ordinary	do.	7½ to 8½	7½ to 8½	
low middling to good middling, do	do.	10 to 11 ⁵ / ₈	10 to 11½	
Wool, tub-washed	do.	35 to 36	35 to 36	
fleece-washed	do.	34 to 35	34 to 35	
unwashed	do.	20 to 24½	20 to 24½	
Tobacco, lugs	do.	4½ to 5½	3 to 5½	
common to shipping leaf	do.	7½ to 10½	6 to 10½	
NEW ORLEANS.				
Flour, superfine	per barrel..	4 25 to _____	3 50 to _____	
extra	do.	4 50 to 5 75	3 75 to 5 00	
choice to fancy	do.	6 00 to 7 50	5 25 to 7 12½	
Corn, white and yellow	per bushel..	60 to 62	50 to 54	
Oats	do.	_____ to _____	33 to 40	
Hay, choice	per ton..	22 00 to 23 00	_____ to _____	
prime	do.	16 00 to 17 00	16 00 to 17 00	

Market-prices of farm-products—Continued.

Articles.	August.	September.
NEW ORLEANS—Continued.		
Beef, Texas.....per barrel..	\$10 00 to \$11 00	\$10 00 to \$11 00
western.....do.....	13 00 to 14 50	13 00 to 14 50
Fulton market.....per half barrel..	11 75 to 12 00	11 00 to 12 00
Pork, mess.....per barrel..	20 75 to 21 00	17 25 to 18 00
Lard.....per pound..	12 to 13½	11 to 12½
Butter, choice Goshen.....do.....	30 to —	30 to 32
choice western.....do.....	17 to 18	22 to 23
Cheese, choice western factory.....per pound..	— to 09	08½ to —
New York cream.....do.....	14½ to 15	12½ to 15
Sugar, fair to fully fair.....do.....	8½ to 9½	10½ to 10¾
prime to strictly prime.....do.....	9½ to 9¾	10¾ to 11
clarified, white and yellow.....do.....	10½ to 11½	11 to 11½
Cotton, ordinary to good ordinary.....do.....	7½ to 9½	8½ to 9½
low middling to good middling.....do.....	10½ to 12½	10½ to 11½
Tobacco, lugs.....do.....	5½ to 8	5½ to 8
low leaf to medium leaf.....do.....	8 to 12	8½ to 12
SAN FRANCISCO.		
Flour, superfine.....per barrel..	4 00 to 4 25	4.00 to 4 25
extra.....do.....	4 50 to 5 00	4 50 to 4 75
family and fancy.....do.....	5 00 to 5 50	5 00 to 5 50
Wheat, California.....per cental..	1 50 to 1 65	1 50 to 1 55
Oregon.....do.....	1 50 to 1 65	1 50 to 1 55
Barley.....do.....	95 to 1 25	90 to 1 10
Oats.....do.....	1 30 to 1 75	1 40 to 1 87½
Corn.....do.....	1 15 to 1 25	1 15 to 1 25
Hay, State.....per ton..	8 00 to 13 00	7 50 to 13 00
Pork, mess.....per barrel..	22 00 to 24 00	23 00 to 24 00
prime mess.....do.....	17 50 to 18 50	17 50 to 18 50
Beef, mess.....do.....	8 50 to 10 00	9 00 to 10 00
family mess.....per half-barrel..	8 50 to 10 00	8 50 to 10 00
Lard.....per pound..	13 to 15	13½ to 15
Butter, overland.....do.....	16 to 18	16 to 18
California.....do.....	25 to 28	25 to 40
Oregon.....do.....	20 to 22½	20 to 25
Cheese.....do.....	12½ to 15	12½ to 15
Wool, native.....do.....	8 to 10	10 to 12
California.....do.....	15 to 19	15 to 22
Oregon.....do.....	15 to 20	15 to 22

LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves.....per cental..	\$10 50 to \$10 75	\$10 00 to \$10 50
good to prime.....do.....	9 50 to 10 25	9 50 to 9 75
common to fair.....do.....	7 25 to 9 25	8 00 to 9 25
Texas and Cherokees.....do.....	— to —	2 75 to 7 50
bulk of the sales.....do.....	9 00 to 9 50	9 00 to 9 75
average.....do.....	9 25 to —	— to —
milch-cows.....per head..	45 00 to 75 00	— to —
veal calves.....per cental..	5 50 to 8 50	5 00 to 8 25
Sheep.....do.....	4 00 to 6 00	4 00 to 6 50
Swine.....do.....	7 00 to 7 25	6 75 to 7 00

Live-stock markets—Continued.

Articles.	August.	September.
PHILADELPHIA.		
Cattle, choice beeves per cental..	\$5 87½ to \$6 50	\$5 87½ to \$6 00
fair to good do.....	5 25 to 5 75	5 25 to 5 75
common do.....	4 50 to 5 12½	3 00 to 5 00
Sheep do.....	2 00 to 5 50	1 00 to 5 75
Swine, corn-fed do.....	9 50 to 10 00	9 00 to 9 25
BALTIMORE.		
Cattle, best beeves per cental..	5 12 to 5 87	4 87 to 5 50
first quality do.....	4 12 to 5 00	4 12 to 4 62
medium or good quality do.....	3 87 to 4 87	3 25 to 4 00
ordinary do.....	3 50 to 3 87	2 50 to 3 00
general average of the market. pr. cental	5 00 to ———	4 00 to ———
most of the sales do.....	4 50 to 5 50	3 62 to 4 50
Sheep per cental..	2 00 to 5 12½	2 50 to 5 00
Swine do.....	9 00 to 9 75	8 50 to 9 25
CINCINNATI.		
Cattle, good to choice native		
steers per cental..	4 00 to 4 75	4 00 to 4 75
fair to medium do.....	3 00 to 3 75	3 00 to 3 75
common do.....	2 00 to 2 75	2 00 to 2 75
milch-cows per head..	———— to ———	———— to ———
veal calves per cental..	———— to ———	———— to ———
Sheep do.....	2 25 to 4 25	2 25 to 4 25
Swine do.....	5 00 to 6 50	5 50 to 6 40
CHICAGO.		
Cattle, choice beeves, 1,300 to 1,550		
pounds per cental..	4 80 to 5 00	4 85 to 5 10
good beeves, 1200 to 1350 p'ds. do.....	4 60 to 4 70	4 50 to 4 75
medium grades, 1050 to 1200 do.....	4 25 to 4 40	4 00 to 4 40
inferior natives do.....	2 00 to 3 60	2 00 to 3 50
Texas do.....	2 40 to 3 60	2 50 to 3 50
Sheep do.....	2 50 to 4 75	3 00 to 4 50
Swine do.....	6 20 to 6 80	6 20 to 6 40
SAINT LOUIS.		
Cattle, good to choice native steers. per cental..	4 50 to 4 90	———— to ———
common to fair natives do.....	3 25 to 4 25	4 50 to 4 90
inferior to common natives do.....	2 00 to 3 25	2 00 to 3 25
Texas, fair to choice do.....	3 00 to 4 00	3 00 to 4 00
Sheep do.....	2 50 to 4 50	2 50 to 4 50
Swine do.....	6 10 to 6 50	6 10 to 6 35
Horses, plugs per head..	30 00 to 65 00	30 00 to 65 00
plain do.....	50 00 to 90 00	50 00 to 90 00
street-car do.....	75 00 to 125 00	75 00 to 125 00
good to extra draught do.....	100 00 to 130 00	100 00 to 130 00
good drivers do.....	175 00 to 225 00	175 00 to 225 00
extra do.....	225 00 to 250 00	225 00 to 250 00
auction horses and ponies do.....	25 00 to 45 00	25 00 to 45 00
Mules, 14 to 15 hands high do.....	85 00 to 120 00	85 00 to 120 00
15 to 16 hands high do.....	115 00 to 150 00	115 00 to 150 00
extra do.....	175 00 to 185 00	175 00 to 185 00
NEW ORLEANS.		
Cattle, Texas beeves, choice per head..	40 00 to ———	40 00 to ———
first quality do.....	35 00 to ———	35 00 to ———
second quality do.....	30 00 to ———	30 00 to ———
western beeves per cental..	4 50 to 5 50	———— to ———
milch-cows per head..	40 00 to 90 00	40 00 to 90 00
veal calves do.....	7 00 to 9 00	7 00 to 9 00

Live-stock markets—Continued.

Articles.	August.	September.
NEW ORLEANS—Continued.		
Sheep do.....	\$2 00 to \$6 00	— to —
Swine per cental..	6 00 to 8 50	— to —
Horses,* good condition per head..	— to —	\$150 00 to \$200 00
good plugs.....do.....	— to —	100 00 to 150 00
common.....do.....	— to —	40 00 to 80 00
Mules, first-class, broken.....do.....	— to —	190 00 to 225 00
good, suitable for sugar-work- ing, broken.....do.....	— to —	175 00 to 200 00
good, suitable for city use, broken.....do.....	— to —	175 00 to 225 00
small, suited to rice and cotton planters, broken.....do.....	— to —	100 00 to 150 00
green mules generally sell about \$10 less per head than broken ones.		

* Horse-market closed during the summer months.

FOREIGN MARKETS.

WHEAT.—The thrashing-machine has dissipated the hope cherished by British farmers and traders that the fine growing weather of the later season had remedied the injuries of the winter and spring upon their wheat-crops. Dissatisfaction with the actual yield is most strongly and generally expressed in the eastern counties. The latest general estimates claim not over 24 or 27 bushels per acre as the average yield. The grain, however, is fine, plump, and very heavy, averaging in many localities from 65 to 67 pounds per bushel. This development of the situation resulted in an advance of 1 or 2 shillings per quarter in nearly all the English country markets, yet the new harvest has been but sparingly marketed. The views of the farmers as to the coming demand are in advance of those of the buyers, who are disposed to regard some of the representations of disaster to the crops as extravagant. The metropolitan markets have not yet responded to this local advance, but hold more firmly to previous rates. The English wheat-trade is more under cosmopolitan influences than formerly. The large supplies reported in America and Russia render a general and decided advance a matter of serious risk. The varying requirements of continental Europe constitute an element of uncertainty, but statistical inquiry is bringing it within more manageable limits. Among the new enterprises undertaken to facilitate this inquiry is the International Seed and Corn Market of Vienna, which was opened August 21. Herr Devez, head of one of the bureaus of the ministry of commerce, appeared in behalf of the minister, and in an interesting speech cordially gave the indorsement of the imperial government to the movement. A statistical report, read by Herr Leinkoff, estimates the wheat-crop of Hungary at 300,000 hectoliters (2,270,000 bushels) below average, while the Austrian crop was expected to show a surplus of 500,000 hectoliters, (1,418,910 bushels,) leaving a net deficiency for the Austro-Hungarian monarchy of 300,000 hectoliters, (851,346 bushels.) Of the other bread-stuffs the Austro-Hungarian territory will show a decline of 1,900,000 hectoliters (5,391,758 bushels) compared with an average yield in rye, a surplus of 2,300,000 hectoliters (6,527,000 bushels) of barley, and a

surplus of 5,000,000 hectoliters (14,189,100 bushels) of oats. The grain exports from the crops just gathered are expected to aggregate about 4,000,000 hectoliters (11,351,280 bushels) of wheat; 5,000,000 hectoliters (14,189,100 bushels) of barley, and 7,000,000 to 8,000,000 hectoliters (19,864,740 to 22,702,560 bushels) of oats. The short crops of rye will leave but a small quantity available for export.

Herr Wyngart read a report on foreign wheat-crops, estimating a moderate deficiency in England, France, and Germany, (excepting Bavaria and Saxony;) a full average in Roumania, Switzerland, Sweden, Norway, Denmark, and Northern Italy; a crop above average in Bavaria, Saxony, Austria, and Russia. The estimate of the English harvest, however, was made prior to the late developments, which show the crop to have been shorter than English agricultural authorities were willing to believe. Rye was below average in all Europe, except Russia and France; barley was full average or above in all except Prussia, Southern Bavaria, England, and Sweden; oats full average or above in all except Prussia, England, Sweden, Norway, and Denmark.

Estimates were presented on this occasion before an assembly of 5,000 farmers and grain dealers, representative statisticians of different countries. Europe is naturally grouped into two classes of countries—producing and consuming, according as they present a surplus or deficiency in their productions to meet their home demand. Of the former, Russia, with a fine crop in her southern provinces, was enabled to report a full average in spite of a deficit of 70 per cent. in the small crop of her northern provinces. Austro-Hungary was rated between a full average and 2 per cent. below. Roumania was estimated at 25 per cent. below average, which does not agree with the official estimate of Herr Wyngart, given above. Of the consuming countries, England was estimated at 5 per cent. below average, whereas the deficiency will probably be not less than 10 per cent., according to later developments. In Germany, Bavaria and Saxony had a good average harvest, but Mecklenburg is 20 per cent. below, Prussia 18 per cent., Baden 10 per cent., and Würtemberg 5 per cent. The south, southeast, and southwest of France show a yield about 24 per cent. below average, but the other portions of the country show a full average. Switzerland is 10 per cent., Sweden, Norway, and Denmark 15 per cent., and the Netherlands 30 per cent. below average.

The sales of English wheat in the United Kingdom during the week ending August 26 amounted to 21,298 quarters, at 45s. 5d. per quarter, against 37,980 quarters, at 53s., during the corresponding week of 1875. The London averages were 50s. 3d. on 1,112 quarters. The imports into the United Kingdom during the week ending August 19 amounted to 1,070,424 cwt. The Mark Lane market opened on Monday, August 21, with a tendency to firmness, caused by the broken and unsettled state of the weather, though quotations did not advance. English wheat was in small supply, while foreign wheats, mostly of old crops, were abundant. Essex and Kent white, old and new, brought from 45s. to 50s. per quarter; ditto red, 43s. to 48s.; Norfolk, Lincolnshire, and Yorkshire red, 42s. to 44s.; Dantzic mixed, 50s. to 54s.; Königsberg, 49s. to 52s.; Rostock, 50s. to 53s.; Pomeranian, Mecklenburg, and Uebermark red, 47s. to 50s.; Ghiska, 40s. to 43s.; Russian hard, 42s. to 43s.; Saxonska, 42s. to 44s.; Danish and Holstein red, 46s. to 49s.; American red, 42s. to 47s.; Chilian white, 46s.; Californian, 47s.; Australian, 48s. to 49s. In Liverpool British white wheat brought 9s. 6d. to 10s. 2d. per cental; ditto red, 9s. 2d. to 9s. 10d.; Canadian white, 9s. to 9s. 7d.; red club and golden drop, 8s. 10d. to 9s. 3d.; American

red winter, 9s. to 9s. 6d.; Minnesota No. 1, 8s. 10d. to 9s. 2d.; No. 1 spring, 8s. 9d. to 9s.; No. 2 spring, 7s. 10d. to 8s. 3d.; Bombay, 8s. 6d. to 9s.; Egyptian, average, 6s. to 8s.; California, 9s. 2d. to 9s. 5d.; club, 9s. 8d. to 9s. 10d.; Oregon, 9s. 7d. to 9s. 9d.; Chilian, 8s. 8d. to 9s.; Australian, 9s. 10d. to 10s.

At the close of the last week in August the French harvest had been completed, but the results had not been ascertained, except that the grain was supposed to average 6 or 7 per cent. greater in weight per bushel than in 1875. In the north, east, and south, with plentiful supplies, prices range from 49s. 2d. to 52s. 9d. per quarter; in the center, from 46s. 6d. to 47s. 10d. During the week 22 county markets had advanced or tended to advance, against 34 the week previous; 42 were reported from calm to firm, against 32 the previous week; 85 had declined or shown a declining tendency, against 83 the previous week. The total showing indicated a weakness on the whole, and a preponderance in favor of lower prices. At Paris, wheat on the spot showed a declining tendency. The week's arrivals at Marseilles amounted to 84,570 quarters, increasing the already inconvenient presence of extra supplies upon that market, and causing a decline of prices. At Antwerp the prospect of an average crop depressed prices. Amsterdam notes a dull trade, with a tendency in prices to weaken. In Berlin, with an active trade in wheat, both on the spot and *in transitu*, prices did not advance. At Berlin the receipts were of fine quality, but the yield of the dependent wheat-region was reported below average; the trade was quiet at previous quotations; Holstein and Rostock sold at 50s. 6d. to 52s. per 504 pounds. At Leipzig the trade was dull at old prices; low water had caused some stagnation in the milling business. The Odessa wheat-market was very animated, in spite of discouraging advices from abroad; the sales were considerable, and the stock on hand remarkably low, as supplies from the interior were slow in coming in; prices consequently firm. At Alexandria supplies had begun to come in more freely, without, however, disturbing the status of prices; the amount of business was quite limited.

FLOUR.—The imports of flour into the United Kingdom during the week ending August 19 amounted to 67,307 cwt., against 124,132 cwt. the previous week. The trade was without change, and the amount of business very limited. The best town households, in Mark Lane, brought 36s. to 43s. per sack of 280 pounds; best country households, old, 34s. to 36s.; Norfolk and Suffolk, old, 29s. to 31s.; French, 30s. to 35s.; American and extras, 21s. to 24s. per barrel of 196 pounds. At Liverpool English and Irish superfines were quoted at 36s. to 38s. per 280 pounds; ditto extras, 39s. to 41s.; French, 38s. 6d. to 46s. 6d.; Trieste, 47s. 6d. to 52s. 6d.; Chilian, 25s. to 28s.; Californian, 34s. to 37s.; American western and extra State, 22s. to 24s. 6d. per barrel; Baltimore and Philadelphia, 22s. to 25s. 6d.; Ohio and extra, 22s. to 25s.; Canadian, 22s. to 26s.; patent, 29s. to 33s. The prices of eight marks in the Paris market, August 26, averaged 37s. per 280 pounds; superior flour 36s. 2d.

MAIZE.—In Mark Lane, at the close of August, white maize was quoted at 26s. to 27s. per quarter; yellow ditto, 25s. to 26s. In Liverpool American white, per 480 pounds, 26s. 6d.; ditto mixed, 25s. to 25s. 3d.; Galatz, 26s. 9d. to 27s.; Danubian, 25s. 3d. to 25s. 6d.; Dari, 23s. to 24s.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

OCTOBER, 1876.



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1876.



MONTHLY REPORT.

STATISTICAL DIVISION,
DEPARTMENT OF AGRICULTURE,
Washington, D. C., October 25, 1876.

SIR: I respectfully present for publication a digest of crop-reports for October; extracts from correspondence; a communication presenting a new plan in the preparation and marketing of cotton; paper of Mr. L. F. Allen upon American live stock, presented to the agricultural congress at Philadelphia; minor statistics; domestic and foreign markets, &c.

Respectfully,

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

DIGEST OF CROP-RETURNS.

WHEAT.

Our October returns indicate a reduction in the yield of the wheat-crop of nearly one-sixth, while the quality is somewhat superior. More accurate statistics may possibly be given after the results of threshing are more fully known. Every section of the Union indicates a reduced product except the Middle States, which increased about 2 per cent. The New England States fell off 4 per cent.; the South Atlantic States 2 per cent.; the Gulf States 27 per cent.; the Southern inland States 8 per cent.; the States north of the Ohio River 14 per cent.; the States west of the Mississippi River 27 per cent.; the Pacific States nearly 2 per cent. These figures point to a yield of about 245,000,000 bushels. This, however, will be the subject of further examination and inquiry in our November returns.

The condition of winter-wheat at the date of our last report before harvest (July 1) was about 5 per cent. below average. It had suffered severely from winter-killing in all the Northern States; but the conditions of the growth during the spring months were, on the whole, quite favorable, and still better during June. At the end of May, Michigan was the only Northern State in which winter-wheat was reported as of a full average condition; but on the first of July the general improvement of the crop had brought several other States up to the same figures. In the South Atlantic States a mild winter, followed, generally, by favorable spring weather, presented a condition of extraordinary

promise, with a remarkable absence of the usual drawbacks. Every county in Maryland reported a full average condition, and some, 20 per cent. above. Only seven counties in Virginia fell below average, while most of the counties of North Carolina were above; but farther south rust and insect-ravages had already left their mark upon the growing crops. These destructive influences, aggravated by local freshets, affected the crops of the Gulf States and Southern inland States, (except West Virginia,) so that, at the end of June, the whole wheat-field south of Virginia and the Ohio River indicated a condition of but three-fourths of average. West Virginia continued to improve, and rose to 15 per cent. above average before harvest. A general improvement was noted in the States north of the Ohio River, but the injuries from winter-killing were too severe and extensive to be repaired. All of the States west of the Mississippi improved during June, except Nebraska; Mississippi and Kansas rising above average. During this month the condition of the crop on the Pacific coast fell below average.

Spring-wheat, on the 1st of July, had fallen to 15 per cent. below average. In the New England States, it had improved; but this improvement was more than counterbalanced by the imperfect conditions of growth, aggravated by insect ravages, in the great spring-wheat regions of the Northwest. The Pacific States also reported improvement; but our August returns indicated a decline during July, which still further reduced the general condition, especially from the depredations of insects in the Northwest. On the 1st of September, the general estimate of condition for both winter and spring wheat was 81 per cent. of a full average.

Our October returns, as a general thing, indicate an advance in the wheat yield of those States in which the yield of 1875 had fallen below that of 1874, and *vice versa*; but in some States, especially in the Northwest, there is a falling-off from even the reduced yields of 1875, viz, New Jersey, Pennsylvania, Michigan, Indiana, Illinois, Iowa, Kansas, and Oregon. In the New England States, extreme summer temperature at a critical stage of the crop is complained of, together with occasional injuries of the midge. In some parts of Maine, early sowings yielded lightly, while later sowings were very satisfactory. In the Middle States, the marked increase in New York and Delaware more than counterbalanced the slight decline in Pennsylvania and New Jersey; but the increased yield of this section is not sufficient to repair the losses of 1875 so far as to bring the crop up to the standard of 1874. Maryland and Virginia have made up their losses of 1875; but the decline in the other South Atlantic States, in the Gulf States, and in the Southern Inland States, more than absorbs their previous gains upon the crop of 1874. Frederick, Maryland, reports that fields treated with phosphate excelled others in yield, and the crop exhibited a better color; Calvert made the best crop for many years. Kentucky, West Virginia, and Ohio have considerably increased the yield of 1875; but that showed a great reduction from the previous year. The other States north of the Ohio report a reduced yield, making the crop of this region about 14 per cent. less than in 1875, and nearly one-fourth less than in 1874. The western and northwestern counties complain of destructive insect ravages. West of the Mississippi, the crop of 1875 was a little larger than that of 1874; but that of 1876 shows a decline of 27 per cent. from its predecessor. Insect ravages were numerous reported, and the grasshoppers made their annual incursion in the northwestern counties in time to injure the spring-wheat. Reports of their ravages also come from several points in the Territories. On the

Pacific coast, California barely equaled her reduced crop of 1875, while that of Oregon experienced a still further reduction of 12 per cent.

RYE.

The rye crop of 1876 is reported 4 per cent. less than that of 1875, but in quality it averages somewhat above its predecessor. The larger deficiencies are mostly in States that produce small crops, though Illinois and Wisconsin, with their large crops, produce 8 per cent. and New York 7 per cent. less than last year. The larger producing States generally report yields not greatly varying from those of 1875, while Kansas, in which rye culture has grown rapidly within the last few years, is 13 per cent. in advance of her previous figures. Of the great regions of the country, New England has made a slight increase; the Middle States, which produce about one-third of the crop of the country, fell off about 5 per cent.; the South Atlantic States about equaled their previous crop; the small crop of the Gulf States fell off about 10 per cent.; the Southern Inland States about held their own; the States north of the Ohio River, producing about 28 per cent. of the whole, fell off 7 per cent.; the States west of the Mississippi report a large increase, especially Nebraska, 42 per cent., and Kansas, 13 per cent., counterbalancing the deficiencies in Minnesota and Iowa, and bringing the yield of the whole section up to 9 per cent. above the previous year. On the Pacific coast, California advanced 3 per cent., while Oregon fell off 7 per cent.; but the crop of the two States is about 2 per cent. greater than last year.

OATS.

On the basis of the October returns, the oats crop of 1876 shows a falling-off of 23 per cent., compared with its predecessor. Every section of the Union is deficient, viz: New England, 7 per cent.; the Middle States, $7\frac{1}{2}$ per cent.; South Atlantic States, 1 per cent.; the Gulf States, 5 per cent.; Southern Inland States, 2 per cent.; the States north of the Ohio River, 25 per cent.; the States west of the Mississippi, 49 per cent.; the Pacific States, 4 per cent. The States reporting a yield equal to that of last year are: Pennsylvania, 102; Delaware, 109; South Carolina, 126; Georgia, 115; Florida, 107; Alabama, 100; Louisiana, 104; West Virginia, 113; Kentucky, 103; Ohio, 102; California, 100. The greatest deficiencies were found in Kansas, losing 51 per cent.; Arkansas, 45 per cent.; Illinois, 39 per cent.; Missouri, 36 per cent. Ohio is the only Northwestern State that did not fall short. In the New England and Middle States, the crop was largely reduced by droughts prevailing at a critical period in the development of the grain. Several counties in the South bear their usual testimony in favor of winter-oats, but spring sowings were liable to rust. In Ohio, where the aggregate product was enlarged, there are complaints in several counties of light weight. The crop was affected by rust in many counties north of the Ohio River, and several report great injury in the shock from rain. In some cases, the grain was so light and shrunken as to be blown out of the windmill with the chaff. The same causes operated west of the Mississippi, where the ravages of grasshoppers added a fresh element of disaster. In very many localities, fields were not harvested, and where the grain was reaped it was frequently fed without thrashing. The grasshopper visitation was especially severe at several points in the Territories. California on the whole had a good crop, but Oregon was deficient. In Washington Ter-

ritory, winter-oats are spoken of at several points as yielding very heavy crops, the Scotch Potato variety being especially satisfactory.

The crop equaled last year's crop in quality only in Delaware, 100; Virginia, 100; North Carolina, 100; South Carolina, 104; Georgia, 106; West Virginia, 109; Kentucky, 112; Ohio, 105; California, 100. The greatest deficiency, 52 per cent., was in Missouri; Kansas was 37 per cent. short, and Illinois 34.

BARLEY.

The barley crop of the country yields about 6 per cent. less than last year. In all the States east of the Mississippi River, the yield is deficient, except in Connecticut and Georgia, each of which reports an increase of 2 per cent., and Kentucky, which has equaled her previous crop. A great falling-off is reported in the Middle States, in the States north of the Ohio River, in the States between the Mississippi and Missouri Rivers, and in Oregon; but Kansas, Nebraska, and especially California, the largest barley-raising State in the Union, have realized a large increase of yield, which, to a great extent, counterbalances the short crops of the other States. New York, the second, and Iowa, the third, in the list of barley-growing States, are deficient; the former 14 per cent. and the latter 12 per cent. Kansas and Nebraska, in which this crop is growing in importance, report increased yields; the former of 5 per cent., and the latter 25 per cent. The quality of the crop equals or surpasses that of its predecessor in Rhode Island, Connecticut, Kentucky, Ohio, Indiana, Minnesota, Missouri, Kansas, and Nebraska; in all the other States there is a decline.

BUCKWHEAT.

The buckwheat crop is reported as full average or above in Rhode Island, Virginia, Arkansas, Kentucky, Ohio, Wisconsin, and California; in the other States, it is below average, the minimum, 50; being in Delaware. From some localities in Maine and Vermont come reports of serious injuries by blight. From some parts of the Middle States, complaints of excessive heat and drought, while in others, excessive rains at the ripening season, greatly injured the crop. In Kent, Delaware, it was prostrated by a storm, September 17. The yield was remarkably fine at several points in Virginia, Carroll County, in that State, and Haywood, North Carolina, reporting the best crop for many years. No returns of the growth of this crop have been received from the Gulf States, but the small crop of Arkansas was quite satisfactory. In Tennessee and West Virginia, the grain was injured by drought. North of the Ohio River it had a varied fortune, enjoying good conditions of growth in some of the more southern counties, while from Michigan come reports of blasting heat drying up the crop. West of the Mississippi it was greatly depleted by the ravages of the grasshoppers, which were reported as especially voracious in several counties of Dakota; in Yankton "not a kernel was left."

CORN.

The condition of the corn crop on the 1st of October, on the whole, was nearly average. In the New England States it was a little above average. The Middle States, except Delaware, report a depressed condition. Drought during the growing season shortened the yield, while

in many counties the grain standing in the shock was seriously injured by heavy rains, especially where the crop was not well ripened. In New Jersey and Eastern Pennsylvania heavy storms prevailing about the middle of September prostrated many fields. Grub worms are reported in a few cases as somewhat troublesome. This section, as a whole, is about 8 per cent. below average. The South Atlantic States, especially in counties near the coast, suffered serious injury to this crop from the September storms above noted, which prostrated fields left uncut, while the heavy rains that followed spoiled a large amount of both grain and fodder. Freshets swept the crops stacked upon the river bottoms, and frosts damaged late crops in one or two counties of North Carolina. Some complaint of damage to upland crops from drought have been received from South Carolina. Maryland and South Carolina are full average, and Georgia largely above, but the deficiencies of Virginia and North Carolina cut down the general condition of this section to 2 per cent. below average. The crop in the Gulf States, on the whole, is about average, Texas reporting an especially fine condition. Conecuh, Alabama, reports the crop as selling at 50 cents per bushel, which is lower than at any time during the past ten years. Local prices show a considerable reduction in this State. Reports of injuries from drought and storms have been received from Mississippi and Louisiana, but the tone of reports from Texas indicates a very superior yield and quality; in some counties prices have fallen to 25 cents per bushel. The southern inland States are all above average, and the promise of large yields had already depressed local prices, especially in districts remote from market. Giles, Tennessee, reports corn selling at 12 or 15 cents per bushel. Kentucky, especially, promises a large crop and a consequent depression of prices, though some counties complain of light crops, the result of drought.

North of the Ohio River there is a deficiency on the whole, the low condition in Illinois and Michigan overbalancing the extra promise in the other States. Ohio reports a superior crop, generally of good quality, though drought in some localities, and excessive rains in others, reduced local averages. Prices in some of the rural districts have fallen to 25 cents per bushel. In Michigan, crops on low, wet lands are reported very poor, and in some cases not worth gathering, indicating injuries from excessive rains, but no reports of injurious frost have been received. Illinois is 6 per cent. below average, though several counties report the finest crop for years. September storms were destructive at a few points. The superiority of upland crops indicates an overplus of rain. Several reporters in Wisconsin mention, with satisfaction, that the crop was too far advanced to be much injured by either frosts or grasshoppers. West of the Mississippi the small deficiency in Missouri is more than repaired by the fine condition reported in all the other States. In Iowa crops were poor in low, wet lands, and the condition in several counties reduced greatly by grasshoppers. In Missouri local damage by storms is reported, but low prices indicate an abundant yield in the larger portion of the State. Kansas is full average, in spite of the grasshoppers and chinchies, and Nebraska is considerably above. Insect ravages were quite severe in several counties of Colorado and Dakota, while frosts were destructive in Utah. The later part of the season, in several trans-Mississippi districts, was quite favorable, repairing to a considerable extent the disasters that had preceded. The crop on the Pacific coast is somewhat below average, the superior condition of Oregon not being sufficient to meet the depression in California.

COTTON.

The October reports indicate a reduction of the condition of cotton during the past month in the ten principal cotton States from an average of 90.5 to 82.7. The October average for these States was 88 in 1875 and 71.7 in 1874. The decline from September is slight in Georgia, Florida, and Mississippi, greater in Louisiana and Arkansas, and greatest in Alabama and Tennessee. There is a small advance in Texas. The figures for the condition of States are as follows: North Carolina, 84; South Carolina, 80; Georgia, 87; Florida, 80; Alabama, 70; Mississippi, 83; Louisiana, 82; Texas, 91; Arkansas, 86; Tennessee, 91. The impairment of the crop prospect has been caused by the equinoctial storm in North Carolina, drought and rust in Georgia, the caterpillar in Florida and Alabama, the boll-worm in Arkansas, and frost in Tennessee. The caterpillar is confined to the southerly portion of the Gulf States. Its depredations are most severe in Alabama. In most of the infested districts its reproduction was too late to destroy more than the top crops.

The September gale prostrated much of the crop of Dinwiddie County, Virginia, and the injury from the storm of September 17 was considerable throughout the tide-water region of the Carolinas. For two weeks following there was an excess of rain in this region. It is stated that the ground in Bertie, North Carolina, was whitened with the staple detached by the violence of the storm. In Warren and Duplin the damage from the equinoctial storm, 15th to 17th of September, is estimated at 20 per cent.; and the loss is large in Lenoir, Pitt, Wayne, Bladen, Beaufort, Edgecomb, Greene, Chowan, and Camden. Rust is prevalent in Wilson and Greene. Picking progressed slowly in North Carolina in consequence of the continuance of bad weather. The pickers in Pitt exhibit positive disinclination to work at the ruling price, 40 cents per hundred. The bolls are opening rapidly in South Carolina, and the top crop will be light. There is some complaint of rust; there has been injurious drought on these uplands, and loss from floods in the bottoms. The caterpillar is reported in Richland. Sea Island cotton in Beaufort is yielding better than last year.

Caterpillars appeared about the middle of July in Liberty County, Georgia, and stripped the plants of leaves, but not so early as to materially injure the yield. Some damage by the caterpillar is reported in Early County and in Muscogee. The principal causes of deterioration were drought, rust, mud and rain. There is much complaint of deficiency of the top crop. In Carroll it is stated that the loss by shedding bolls will be 50 per cent. In some counties favorable weather for opening and gathering is reported, as well as superiority in quality of fiber. It was thought in Oglethorpe that the crop would all be open by the 15th of October, and in Columbia by the 1st of November. In other counties there was little to open at the date of the return.

Caterpillars have reduced the yield in Florida, notably in Columbia. The ripening has been early—"premature," as the records have it. The Gadsden reporter represents the harvest as nearly over, with a product 30 per cent. less than a full yield, and says he has never known, in an experience of 50 years, a crop to be housed so early by a month.

The caterpillar has been somewhat destructive of the top crop in portions of Alabama. The loss is estimated at 50 per cent. in Conecuh; at 40 in Hale, (50 in the southern portion,) where the fields were swept by the invasion as early as the 1st of September. Among the counties mentioning especially the ravages of worms, are Autauga, Baldwin,

Bullock, Coffee, Chickasaw, Chambers, Monroe, and Macon. Drought is reported as the cause of reduced yield in several counties.

The causes of injury in Mississippi are worms, drought, wet weather, and frosts. Late cotton will be seriously injured by worms in Grenada and Choctaw. In Hancock, Paris green was used successfully against the caterpillar. A frost, sufficiently severe to do some injury, is reported in several counties. Injury from wet weather is reported in Hinds, Choctaw, and in other counties.

The crop is injured in Louisiana very generally by drought—continuing in Jackson for ten weeks, causing rust, shedding, and premature opening; 75 per cent. of the product was in readiness for harvest at the first picking. The caterpillar is doing some damage to the top crop.

A favorable season for picking is reported generally in Texas. Picking is progressing very rapidly, and in some counties drought will reduce the length of the harvest period. The loss from drought is placed at 50 per cent. in Bexar. The top crop in Bell is nearly destroyed by grasshoppers, and in Dallas their injuries are serious. The boll-worm is reported in Red River and Rusk.

Fine weather for picking, a heavy growth, a tendency to run to weed in rich lands, more or less injury from drought in light soils, and early ripening are indices of the state of the crop in Arkansas. The boll-worm has been destructive in several counties; more so than ever before in Franklin County. A frost occurred on the 1st of October.

Late cotton has been injured by frost in Tennessee. The season has been fine for ripening and gathering, picking is one to two weeks early, and the harvest will be completed at an early date.

Finally, the general harvest is more advanced than usual; the season is generally favorable for picking; the later pickings will be comparatively light; the causes of injury are not unusually excessive, drought being somewhat prominent in the Gulf States, the September storms on the Atlantic coast, the caterpillar in Alabama especially, and the boll-worm in Arkansas. The season promises to be much shorter than last year; there is less vigor and thrift for future development of fruitage in case of a prolonged season like the extraordinary one of 1875. Though the indications of condition-reports of this Department up to October pointed to four and two-thirds millions of bales last season, there was proved to be a deficiency of lint to seed in the ginning, and other unfavorable indications, which would have limited the crop inevitably to four and one-third millions, but for a full month's delay of killing frost in the Gulf States, fields being green in a large belt up to December 8th. The future of the present season cannot make the crop a deficient one, but will determine how near to the large one of 1875 the result shall come.

POTATOES.

Returns from Maine indicate a fair crop in yield and quality, with the prospect of very remunerative prices. In the other Eastern, and in the Middle States, the condition was largely reduced by a general drought, beginning early in August and protracted into September. The beetle has injured the crop extensively in New York, and occasionally in all the other States of this section, except Maine. In Indiana, Pennsylvania, the crop is rotting badly in the ground; Elk had almost a failure in yield, with excellent quality; Lycoming, a like deficiency in yield with very poor quality; Cambria, a large growth of vines, but not more than 75 or 80 bushels per acre; Sullivan, small and

immature potatoes, the vines having died prematurely. In Armstrong, early potatoes were extra good, but late, few and small. In New York the average condition is reduced to 65. New Jersey returns 73; Pennsylvania, 68; Vermont and Maryland, 83. In Frederick, Maryland, potatoes sold one year ago as low as 20 cents per bushel; now the price is 70 cents, and advancing. In Virginia the later crop was, to a considerable extent, killed in the germ by early drought. Dinwiddie reports that not 10 per cent. of the late planted came up; the condition in the State averages 88. In the remaining section south of the Potomac and the Ohio, in which the Irish potatoe is a minor crop, the average condition is not much, if any, below 100. Local extremes of high and low condition are included in this general average. In Beaufort, N. C., the late crop is almost a failure from rotting; in Arkansas, Garland reports a complete failure, but Izard an abundant crop. In Gibson, Tennessee, the crop is almost a failure; and in Montgomery, "used up by drought and the bugs;" but the State averages 100.

North of the Ohio, returns confirm the indications in the September reports of a comparatively poor crop in both yield and quality. In addition to the reductions by unfavorable weather, and by the beetle, previously reported, damages from blight are noted in Franklin, Ohio, and Fond du Lac, Wis.; from rotting, in Chippewa, Mich., and Grant, Brown, and Clark, Wis. In Henry, Ohio, the price is 70 cents per bushel, against 20 cents last year; in Delta, Mich., a first-rate crop sells at 50 cents per bushel, wholesale; in Noble, Indiana, a crop less than 25 per cent. of an average, at \$1.25 per bushel. The average condition in Michigan is 55; Ohio, Illinois, and Wisconsin, 83; Indiana, 89. West of the Mississippi the condition is higher, but the promise is somewhat below an average crop. In the latter part of the season grasshoppers have been the most general cause of reduction in the States and Territories between the Mississippi and the Rocky Mountains. The lowest condition in this section is 81, in Kansas; the highest 96, in Minnesota. Rot is reported in Alamakee, Marion, and Lee, Iowa; and in Greene, Missouri, "the early potatoes are all rotting at one end."

On the Pacific slope, California reports a condition 7 per cent. above average, or higher than that of any other State in the Union. Oregon falls to 94. In Utah the crop has been extensively damaged by early frosts.

The entire returns, with their various local specifications concerning actual or prospective yield and quality, point to a short crop, with great variations in quality, and with high prices. The average of condition for the entire country is 77.

SWEET POTATOES.

Returns give promise of a full average crop of good quality. On the Atlantic coast, from New Jersey to South Carolina inclusive, the condition ranges from 104 to 97. It has been reduced in Georgia to 91; Florida, 84; and Alabama, 87, by a general and protracted drought. In Mississippi the drought was severe and disastrous to the crop in localities, but being less general in extent, the condition falls only 2 per cent.; in Louisiana, the same cause brings it down to 88. Texas averages 96; Coryell reports the best crop ever raised, all in fine condition; Upshur, a yield equal to that of last year, with an increase of 100 per cent. in acreage; Bexar, a failure of the crop from a drought of three months' continuance. The condition is 90 in Nebraska, and 94 in Illinois; but in all the remaining States, in which the crop is of any account, the range is from 98 in Indiana and Kansas, up to 109.

in Tennessee and California. There is scarcely an exception to favorable returns respecting quality, so far as it is referred to.

SORGHUM.

Nearly all the States which grow sorghum to any considerable extent, report a condition averaging above 100; South Carolina, 101; North Carolina and West Virginia, 103; Alabama, Mississippi, and Nebraska, 104; Texas and Ohio, 105; Georgia, 107; Tennessee and Kentucky, 109. Madison, Virginia, reports the largest crop ever raised. In Georgia, the return from Gwinnett states that the crop has become an important one in the county, and that growers, with "the improved evaporator," are making sirup equal to the best New Orleans; Stewart, that a good crop, matured before the drought came on, has been about all ground up; Jackson, that since the introduction of evaporators, sirup superior to any other is made, and that the crop will make thousands of gallons; Hart, that the crop is sufficient to make 10,000 gallons of sirup.

In Alabama, Conecuh reports that the crop, well matured, this season, is more or less grown upon every farm, and is conferring great benefit on the poorer classes. In De Kalb the quantity is above average, and the quality far superior to that of any previous crop; in Clay, the crop is very good, and is becoming one of the important industries; in Covington, is grown in large quantities, and found to be very profitable, promising to supersede sugar-cane.

In Texas the condition improved in September; Coryell returns 130; in Rusk, about 30,000 gallons of sorghum sirup have been made. The sirup sells for 50 cents per gallon. "Sorghum will henceforth be a staple product of the county." In Arkansas, Fulton reports that the black-top variety was injured by rust, while other kinds escaped. In Tennessee, Monroe reports that "sorghum mills and evaporators are the order of the day;" also that sirup from the red-top variety is "very superior." In Blount the abundant crop was never excelled. In Allen, Ky., an unprecedented quantity of sorghum molasses will be manufactured. In Henry County, Ohio, more has been grown than for the last three years. In Jefferson, Illinois, the crop exceeds all previous ones, and the cane is very rich in juice.

TOBACCO.

Cheshire and Sullivan in New Hampshire, Berkshire and Hampshire in Massachusetts, and Hartford and Litchfield in Connecticut, all being principal tobacco counties, return each a condition of 100. In New York the largest tobacco county, Onondaga, returns 70; other counties range from 75 to 100. In Pennsylvania, Lancaster reports that a larger crop than ever before has all been housed in good condition. In York, the next in importance, the condition is 110. Cumberland, 90, (producing but little) is the only county below 100.

In Maryland the condition averages about 82. Prince George, the heaviest county, is reported at 90. Returns from Calvert and Montgomery state that the quality will be inferior. The crop was considerably damaged by the equinoctial storm.

In Virginia, the average condition returned September 1 was 65. During the month the progress in some localities was counterbalanced by damages from storms and depredations by worms in others, so that the general condition October 1 averaged about the same. Pittsylvania,

first in production, returns 50 per cent. of an average condition; Halifax, next, 70. In the latter, and in Franklin, 55, and Dinwiddie, 50, the crop has suffered greatly both from the severe equinoctial storms and the depredations of worms. In Mecklenburg, 66, the crop is so late that much of it must be cut before maturing. Some of the counties producing smaller quantities, as Montgomery and Carroll, report that the crop has been housed in superior condition. As a rule the lighter counties are higher in condition than the heavier, many of them reaching 100.

In North Carolina the average is 73. In Caswell it has been reduced to 80 by unprecedented ravages of the horn-worm. In Rockingham, 35, the crop is very late and exposed to damages by frost. Orange returns 33 in yield, but fair in quality. As in Virginia, a higher condition is generally returned in counties producing small quantities.

Tennessee averages 91, an advance of 11 per cent. in September. The figures in some of the important counties are: Montgomery, 80; Henry, 85; Smith, 95; Weakley and Dickson, 100; Obion, 110; Macon, 125.

In West Virginia a high condition is reported, averaging 106. Among the returns, only two small counties, Lewis and Pleasants, each 90, fall below 100. Among the more important returns are: Kanawha, 105; Putnam and Cabell, 100; others range from 100 to 125.

Kentucky reports an advance in condition during September from 77 to 83. General exemption from insect depredations and very favorable conditions of weather combined to effect this result. Daviess reports a promise of the best crop ever made, and the largest except that of 1872. In Webster, Breckinridge, and Warren the crop has been nearly all housed in good condition. In Lewis the yield and quality exceed the capacity of tobacco-houses for successful handling. In Owen this has been the best year in the last twelve for the crop. In Christian and Hopkins the condition is 100. In Bracken the yield is 100, but the early cut was much injured by damp weather, causing it to rot in the barns. In Graves, the yield is but 40, but the quality good, and nearly all is housed. Simpson has not more than 25 per cent. of a crop. Ohio has many very trashy crops. In Metcalf a large part is too late to mature. In Pendleton the stem of a considerable portion has rotted in the barn, causing the leaves to fall off. Russell is the only county reporting injury from frost.

In Ohio the average condition advanced, in September, from 97 to 104. Montgomery, the leading tobacco county, reports an extra crop of seed-leaf; Preble, that the crop has been secured "in splendid condition." In Monroe, the crop has suffered from wet weather; that county and Richland (in which the production is small) are the only ones, among thirteen, returning tobacco below 100.

In Indiana, Warrick reports a condition of 110, and Pike 120. These counties grow half the crop produced in the State. Among twelve returns, all, except two unimportant ones, are 100 or above.

The month of September was also very favorable to the crop in Missouri. The returns indicate a surprising improvement in condition—advancing from 87 to 107; Howard and Lincoln return 125; Carroll, Stoddard, and Macon, 110; Montgomery, 75, is the only important county reporting below 100.

THE PEA CROP.

Acreage.—The States indicating an increase in acreage, compared with last year, are Oregon, 2 per cent.; Virginia, Arkansas, and Kentucky, 3; Florida, Texas, and California, 4; Michigan and Minnesota,

8; Nebraska, 16; Ohio reports a decrease of 14 per cent.; Mississippi and Louisiana, 10; Alabama, 9; Wisconsin and Iowa, 7. In the remaining States the variations from the acreage of the previous year are slight.

Condition.—In Connecticut, Maryland, West Virginia, Kentucky, Minnesota, and Nebraska, the condition averages 100; in California, 101; the remaining States, below 100. The lowest is in Louisiana, 81; the next in order of ascent are Mississippi, 84; Alabama, 85; Georgia, 86; Florida, 89; Pennsylvania, 91; Illinois and Iowa, 93; New York, Texas, and Wisconsin, 95. A general and protracted drought was the main cause of reduction in the Gulf States.

BEANS.

The only States in which the condition does not fall below 100 are, New Jersey, Delaware, and Oregon, 100; California, 103; Vermont, 104; and South Carolina, 107. Grasshoppers were very destructive to the crop in the section visited by them. Rust is reported in Androscoggin, Maine, excessive wet weather in Guthrie and Marion, Iowa, and drought in some other localities. The States returning the lowest averages are Nebraska, 65; Alabama, 76; Iowa, 79; Minnesota, 81; Maryland and Illinois, 84; Rhode Island, 87; Connecticut, 90; New York, 91. The other States range between 92, in New Hampshire, Pennsylvania, and Ohio, and 99 in Virginia, West Virginia, Tennessee, and Wisconsin.

FATTENING CATTLE.

The numbers of fattening cattle are apparently somewhat less than last year, though the difference is small. Maine and Vermont, most of the Southern States, and especially the States of the Missouri Valley, return increasing numbers; while the returns from the Middle and Central Western States are uniformly below 100. Their condition is very generally higher than the returns of condition last year, the principal exceptions being in New York, New Jersey, and in New England.

Table showing the condition of the crops, &c., on the first day of October, 1876.

States.

	WHEAT.		RYE.		OATS.		BARLEY.		BUCK-WHEAT.	CORN.
	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.		
Maine.....	101	96	96	98	94	99	94	97	95	98
New Hampshire.....	93	94	90	97	87	95	88	95	92	103
Vermont.....	92	102	98	104	94	96	93	96	97	97
Massachusetts.....	100	100	100	105	96	90	93	98	80	100
Rhode Island.....	.....	.....	90	100	82	92	75	100	100	102
Connecticut.....	100	100	106	105	99	86	102	102	93	110
New York.....	114	98	93	97	83	89	84	93	77	91
New Jersey.....	99	104	99	101	99	99	.....	.....	84	90
Pennsylvania.....	99	104	97	99	102	97	92	98	85	93
Delaware.....	103	100	100	100	109	100	.....	.....	50	100
Maryland.....	112	102	100	99	99	95	100	.....	88	100
Virginia.....	108	106	99	101	97	100	.....	.....	100	97
North Carolina.....	85	97	99	98	94	100	93	.....	93	100
South Carolina.....	84	93	105	104	126	106	104	.....	104	100
Georgia.....	64	85	100	99	115	106	102	99	.....	111
Florida.....	101	.....	101	98	107	94	.....	.....	.....	90
Alabama.....	68	77	97	93	100	96	.....	.....	.....	105
Mississippi.....	70	90	86	95	97	97	.....	.....	.....	94
Louisiana.....	100	93	100	100	104	95	.....	.....	.....	99
Texas.....	70	89	89	99	91	99	99	.....	106	119
Arkansas.....	62	79	81	85	55	77	83	92	92	103
Tennessee.....	84	94	94	97	94	95	91	96	.....	101
West Virginia.....	129	117	105	104	113	109	.....	.....	96	101
Kentucky.....	106	124	102	116	113	112	100	125	100	111
Ohio.....	105	121	101	107	102	105	96	103	101	107
Michigan.....	92	92	89	99	85	92	96	97	86	88
Indiana.....	100	123	98	103	92	97	94	103	97	102
Illinois.....	82	97	92	98	61	60	73	72	95	94
Wisconsin.....	62	82	92	96	79	82	85	85	101	110
Minnesota.....	60	101	96	105	77	78	102	102	82	108
Iowa.....	62	105	95	101	76	73	88	96	94	105
Missouri.....	106	108	100	102	64	48	100	100	94	95
Kansas.....	97	102	113	101	49	63	105	101	86	100
Nebraska.....	110	118	102	102	76	75	135	112	75	109
California.....	100	100	103	100	100	100	114	101	100	97
Oregon.....	86	92	93	94	92	98	94	97	98	106

Table showing the condition of the crops, &c., on the 1st day of October, 1876—Continued.

States.	POTATOES, (<i>Solanum tuberosum</i> .)	POTATOES, (<i>Batatas ed- ulis</i> ,) SWEET.	TOBACCO.	BEANS.	PEAS.		SORGHUM.	SUGAR-CANE, (not sorghum)	COTTON.	OLD WHEAT.		FATTENING-CATTLE.	
	Average condi- tion October 1.	Average condi- tion October 1.	Average condi- tion October 1.	Average condi- tion October 1.	Average com- pared with last year.	Average condi- tion October 1.	Average condi- tion October 1.	Average condi- tion October 1.	Average am't in your coun- try compared with last year.	(Answer in hun- dreds with other ques- tions.)	Average num- ber of fatten- ing cattle com- pared with last year.	Average condi- tion October 1, compared with last year.	Average condi- tion October 1, compared with last year.
Maine.....	86	.....	.....	98	100	96	.....	.....	.....	100	.....	103	96
New Hampshire.....	83	.....	100	92	98	98	.....	.....	.....	96	.....	95	92
Vermont.....	89	.....	.....	104	98	97	.....	.....	.....	96	.....	106	96
Massachusetts.....	66	.....	106	97	.....	.....	.....	.....	.....	.....	.....	93	97
Rhode Island.....	44	.....	.....	87	.....	.....	.....	.....	.....	.....	.....	70	90
Connecticut.....	53	.....	101	90	100	100	.....	.....	.....	102	.....	91	86
New York.....	65	.....	92	91	97	95	.....	.....	.....	.....	.....	95	94
New Jersey.....	73	104	.....	100	.....	.....	.....	.....	.....	79	.....	98	93
Pennsylvania.....	68	97	100	92	98	91	.....	.....	.....	88	.....	98	98
Delaware.....	30	100	.....	100	.....	.....	.....	.....	.....	100	.....	100	100
Maryland.....	83	97	92	84	98	100	.....	.....	.....	71	.....	97	99
Virginia.....	88	99	65	99	103	98	105	.....	97	99	.....	99	103
North Carolina.....	96	97	73	98	97	98	103	.....	84	91	.....	101	104
South Carolina.....	105	98	.....	107	99	96	101	105	.....	97	.....	103	108
Georgia.....	100	91	94	97	98	86	107	.....	80	90	.....	101	102
Florida.....	83	94	87	94	104	89	97	88	88	76	.....	100	99
Alabama.....	100	87	102	76	91	85	104	.....	97	69	.....	103	104
Mississippi.....	94	98	86	96	90	84	104	106	83	.....	.....	103	103
Louisiana.....	.....	88	.....	90	90	81	.....	94	82	.....	.....	95	101
Texas.....	93	96	99	95	104	95	105	101	91	81	.....	103	103
Arkansas.....	95	102	94	94	103	98	.....	.....	86	105	.....	93	102
Tennessee.....	100	109	91	99	100	99	98	.....	71	.....	.....	100	107
West Virginia.....	92	102	106	99	100	100	103	.....	.....	95	.....	96	103
Kentucky.....	98	105	83	98	103	100	109	.....	.....	99	.....	100	106
Ohio.....	83	100	104	92	86	90	105	.....	.....	73	.....	98	104
Michigan.....	55	41	.....	96	108	97	.....	.....	.....	68	.....	96	102
Indiana.....	87	98	110	96	.....	.....	99	.....	.....	69	.....	96	107
Illinois.....	83	94	99	84	100	93	95	.....	.....	73	.....	94	106
Wisconsin.....	.....	.....	106	90	93	95	99	.....	.....	74	.....	99	104
Minnesota.....	96	.....	.....	81	108	100	106	.....	.....	92	.....	102	103
Iowa.....	84	99	101	79	93	93	.....	.....	.....	82	.....	94	105
Missouri.....	95	98	107	95	98	96	98	.....	93	.....	.....	93	105
Kansas.....	81	99	102	94	100	96	97	.....	.....	87	.....	110	102
Nebraska.....	84	90	100	65	116	100	104	.....	.....	110	.....	113	109
California.....	107	109	97	103	104	101	.....	.....	.....	92	.....	120	110
Oregon.....	94	.....	97	100	102	97	.....	.....	.....	93	.....	106	105

EXTRACTS FROM CORRESPONDENCE.

A GOOD DAIRY REGION.—*Illinois.*—*Ogle*: Prof. J. Wilkinson, of Baltimore, Maryland, has been engaged recently at Byron, in this county, constructing a dairy-house or butter-factory, on his subearth cooling and ventilation system, with a capacity for manipulating the milk of four hundred cows. This dairy is for Messrs. Israel Boeis & Son, late of Marengo, McHenry County, who are experienced dairymen, and who, after riding thousands of miles prospecting for the most favorable locality for a butter-dairy, have given this place the preference. Professor Wilkinson, in the Germantown Telegraph, also says:

I have now inspected this locality (Ogle County) with great care, and I am constrained to give it the preference over any other locality that I have ever seen for conducting the dairy business; that is, the manufacture of butter and cheese. The country is rolling, and to the most desirable degree that I ever saw. There is quite a variety of surface-soil, the dark, deep, naturally-drained fertile loam prevailing. It is generally rather light for wheat. From one-third to one-half of the area (near Byron) is wooded, the prevailing trees white, black, and burr oak, white ash, hickory, and cherry. Blue and green grass and white clover are the chief spontaneous grasses, and there is scarcely a place to be found, whether in a natural state or such as has been cropped, where there is not a fine dense sward of these grasses, except where, by slovenly tillage, rag-weed has overgrown everything else. Such rag-weed I never saw—four to seven feet high is common. Red clover grows most luxuriantly, and timothy flourishes in the nearest level portions, as the soil there is more clayey.

This is correct, and in accordance with my own views as to the natural advantages of this locality for the dairy business.

WINTER GRAIN.—*New York.*—*Schoharie*: Wheat and rye look fine. *Onondaga*: Wheat looks finely, and has made a fine growth. *Montgomery*: Abundant rains are giving newly-sown wheat a splendid start.

Pennsylvania.—*York*: The late, continued heavy rains have delayed seeding at the usual time. *Bedford*: Much of the fall sowing is yet to be done; excessive rains have delayed it very much. *Lawrence*: Wheat was sown early and looks well. *Blair*: Have had continuous rains for the last three weeks, consequently much of the seeding must be done late. *Lebanon*: The fall seeding is all done, and the grain is up; the stand is very fine. *Washington*: In some places the grub-worm is working very badly on the wheat in the ground; much wheat has been seeded very late, on account of continued rains, and farmers are not done seeding yet, October 6.

Delaware.—*Kent*: The heavy rains for the last two weeks have put the farmers back in sowing wheat.

Maryland.—*Prince George's*: Seeding of wheat has scarcely yet commenced. *Queen Anne*: Wheat-seeding has been greatly retarded by the frequent rains; very little is yet in the ground. *Harford*: Very little wheat sown yet; continued wet, following extremely dry, weather is keeping the farmers back. *Howard*: Protracted rains have postponed wheat-seeding two weeks; it will be very late.

Virginia.—*Culpeper*: Seeding will be late, the farmers very much behind, owing to excessively wet weather. *Loudoun*: Farmers will be backward in putting in wheat. *King George*: The rains in September have been excessive, and have retarded the sowing of wheat; none has yet been sown. *Mecklenburgh*: Spring oats having proved a failure many years, winter oats have been extensively sown this fall. *Roanoke*: A large crop will be put in this fall. *Fairfax*: A less breadth of wheat will be sown than last year, owing to low prices; the prevailing belief

is that there is no profit in raising wheat under \$1.50 per bushel; Fultz wheat is still the favorite, though more Lancaster will be sown than last year. *Richmond*: Wheat-seeding has been delayed by constant rains; little or no grain sown yet.

North Carolina.—Alleghany: The farmers are about done seeding; the weather has been very favorable, and the small-grain crop is looking fine.

Georgia.—Carroll: Large crops of small grain will be sown this fall, and that is the only way to save this county from utter ruin. *Dooly*: Little sown yet, but that looks fine. *Harris*: People talk of planting wheat and oats more extensively than ever before.

Florida.—Jefferson: The prospect is that a large area will be sown in oats this fall to make up for the deficiency in the corn crop.

Texas.—Bowie: Small grain has not been put in yet, the weather being too warm and dry. *Williamson*: The farmers are very busy in sowing wheat, oats, rye, and barley.

Arkansas.—Baxter: Have just commenced sowing wheat, but the weather is so dry that slow progress is made, and seed is very scarce; the crop must fall short again next year. *Prairie*: During the latter part of August and all of September no rain fell; this has interfered with the preparation of the land, and has prevented the sowing of wheat. *Sebastian*: More wheat is being sown than usual. *Washington*: Very little wheat is yet sown, as the ground is too dry. *Izard*: Very little wheat or rye yet sown, owing to the drought.

Tennessee.—Giles: Cannot prepare stubble-land for wheat until we have rain. A larger acreage will be sown this fall than ever before.

West Virginia.—The very wet weather has delayed the farmers in sowing their wheat; that sown has come up well. *Randolph*: September was too wet to seed.

Kentucky.—Crittenden: The present indications are that more wheat than usual will be sown this fall, and that greater pains will be taken in the preparation of the soil. Drills are being introduced.

Ohio.—Tuscarawas: The farmers are favored with a fine fall for putting in their seed. *Henry*: The acreage of the growing wheat crop is larger than last year. It is mostly drilled, and looks unusually well. *Montgomery*: Seed-wheat was put in the ground in excellent condition—better than for many years—and the weather is fine for the growing wheat. *Preble*: The wheat sown this autumn is in very high condition. *Medina*: It has rained nearly every day the past month; much of the wheat is not yet sown, and many farmers will not sow at all. *Fairfield*: The acreage of wheat sown is increased 25 per cent. *Belmont*: A large portion of the wheat has not yet been sown, owing to the wetness of the ground.

Michigan.—Tuscola: A large amount of wheat has been sown, and nearly all was put in before the 10th of September. The new crop looks very fine. *Barry*: Wheat looks well, but the fly is eating the early sown quite badly. *Wayne*: The new crop of wheat never looked better.

Indiana.—Dearborn: The prospect for the wheat sown this fall is poor. The ground is dry, the month of September has been cold, and the grasshoppers have eaten a great deal as fast as it came up. *Decatur*: An increased acreage of wheat has been sown. *Marion*: The newly-sown wheat is getting a very fine start. *De Kalb*: The growing wheat never looked better. *Warren*: Wheat never looked better. *Ripley*: September has been a favorable month for sowing wheat, and the farmers have improved the opportunity to get it in early. That which has come up looks well.

Illinois.—*Monroe*: The season has been so wet that plowing for winter wheat is very backward; not much sown yet, but a few fields are up and looking well. *Hancock*: An increased area of wheat is being sown. *Jefferson*: The breadth sown exceeds that of last year nearly 33 per cent.

Missouri.—*Camden*: The weather is remarkably fine for farm-work; three-fourths of the wheat is sown. Early-sown wheat never looked better. Rye is also A No. 1. *Cole*: The weather was never more favorable; we have finished sowing wheat, and have increased the acreage 20 per cent. *Moniteau*: The past month has been very favorable for fall work, and a very large breadth of wheat has been sown, in splendid order. *Holt*: The new wheat and rye in the upper part of the county have been nearly all destroyed by the grasshoppers. *Saint Genevieve*: The ground is in remarkably fine condition, and wheat-sowing has been progressing rapidly since the 15th of September. *Platte*: Commenced seeding about the 10th of September. The growing wheat is looking well, the weather being favorable to its rapid growth. *Boone*: The favorable weather has enabled the farmers to put in their wheat in fine condition; but having failed for two consecutive years to raise much wheat, they have not been disposed to sow as much as usual.

Kansas.—*Brown*: The grasshoppers have destroyed about all the wheat, rye, and timothy that have come up, and will doubtless destroy all that has been sowed. The farmers have stopped sowing, owing to their presence. *Sedgwick*: The grasshoppers alighted on the 1st of September, not in such numbers as two years ago, but enough to eat all the young wheat and rye as fast as it appears. Many of the farmers are still sowing wheat. *Bourbon*: The grasshoppers appeared on the 28th of September, and are eating the wheat clean as they go. *Cowley*: The grasshoppers have taken all the early-sown wheat and rye, and they are still with us; they keep us from sowing wheat. *Douglas*: Owing to the prospect of another grasshopper raid, but little wheat was sown until within two weeks; the early sown looks fine. *Woodson*: Grasshoppers came on the 9th of September by the million, and have destroyed all the early-sown grain. *Chase*: The grasshoppers came September 9, and the wheat that had been sown is all destroyed. *Lyon*: The fall sowing of wheat and rye has all been devoured by the grasshoppers. *Osage*: On the 9th, 10th, and 11th of September, the wind from the northwest brought billions of grasshoppers, and consequently all the small grain is a total loss. *Reno*: The farmers are still busy in sowing wheat; some ground is being planted for the third time; only about half the area will be sown that would have been if the grasshoppers had not come; all the early sown was entirely killed. *Shawnee*: The grasshoppers have eaten about half of the wheat and rye sown; the farmers are sowing these grains over again. *Washington*: The farmers are now busy in sowing fall grain; we do not fear the grasshoppers in the spring, for the farmers will plow all they can this fall and winter, with the expectation of killing the grasshoppers in the egg. *Saline*: All wheat sown before the grasshoppers came has been destroyed by them; some farmers have lost 200 acres, and one has lost 1,200.

Nebraska.—*Richardson*: The grasshoppers are thick here, and have taken all the fall sowing. *Pawnee*: Winter wheat and rye are all destroyed by the grasshoppers.

DISEASES AMONG FARM-STOCK.—*Maryland.*—*Worcester*: In one small section, within a few days, a very fatal disease has broken out among cattle, supposed to be Texas fever, communicated by a drove from the South, which passed through.

Virginia.—*Powhatan* : Some cattle have died from murrain, but the number is limited.

North Carolina.—*Rowan* : The cholera is killing many hogs.

Florida.—*Suwannee* : Hogs of improved stock have not suffered as much from disease as others, perhaps owing to the better care.

Louisiana.—*Cameron* : Cattle and horses continue to die from charbon and murrain; also from what is here known as blind and sleepy staggers. It is estimated that 10 per cent. of the gentle horses and of the cattle have died of the above diseases during the season.

Arkansas.—*Izard* : A small per cent. of the cattle have had the disease called black tongue, and a few have died. It has been more fatal among the wild deer.

Kentucky.—*Graves* : Hog-cholera prevails in many localities. *Pendleton* : A few hogs are dying with cholera.

Ohio.—*Henry* : A very fatal disease, not properly cholera, is prevailing among hogs and pigs. The symptoms indicate spinal meningitis, together with glandular enlargement, especially about the throat. Chorea or Saint Vitus's Dance and convulsions are prominent symptoms. All the small pigs die with it; some of the older ones survive. No remedy is known. A distiller has lost 450; one farmer, 23 out of 60; another, 42 out of 60; another, 34, being all he had; and the losses are in like proportion through the neighborhood. A marked feature is that it causes abortion in all pregnant sows attacked with it.

Indiana.—*Steuben* : Several cases of hog-cholera are reported.

Missouri.—*Johnson* : The cholera is making sad havoc with the hog-crop; from 25 to 32 per cent. of the hogs in the county have died within a month. *Moniteau* : Hog-cholera still prevails alarmingly. *Lincoln* : There is a new disease among hogs. They are taken with a sleepy look, the eyes become inflamed, and they finally become blind; the skin becomes scabbed over, the scabs hard and dry. If killed in the last stage, the lungs are black. Some die in a few days and some live two weeks. One farmer boiled poke-root, mixed with bran, fed freely, and has had no new cases since trying it.

NUTS.—*Virginia.*—*Floyd* : The crop of chestnuts and acorns is more abundant than ever before known. There is more mast than hogs to eat it. *Highland* : We have much mast and the hogs are fattening in the woods.

West Virginia.—*Raleigh* : The oak and chestnut mast is fine; hogs fatten on it. *Boone* : Oak mast is most abundant, equal to half a crop of corn for hogs. *Greenbrier* : We have a good mast; in many places it will be sufficient to fatten the hogs and to winter the stock-hogs.

Kentucky.—*Owsley* : We have the finest oak mast for years; but hogs are very scarce. *Lewis* : The mast has not been so heavy for years. *Laurel* : There is a good mast. It will be worth one-tenth as much as the corn crop. *Clinton* : The oak mast is very abundant, enough to keep all the stock-hogs in good condition nearly through the winter. *Russell* : We have a splendid oak mast. Hogs will fatten on it, and will keep in good condition all winter. *Crittenden* : The hickory and oak mast is abundant, more than sufficient to fatten all the hogs in the county.

Illinois.—*Jefferson* : The quantity of all kinds of mast is enormous.

Missouri.—*Camden* : Mast is abundant and stock-hogs are "in clover." *Perry* : The abundance of acorns will make up the deficiency of 25 per cent. in the corn crop.

GRASSHOPPERS IN TEXAS.—*Palo Pinto* : The grasshoppers appeared

on the 17th of September, and are as thick as they ever were here, destroying everything as they go. *Uvalde*: Appeared September 22 in quantities, arriving from the north, and causing some alarm. *McLennan*: Reached here on the 20th of September, and have materially damaged the cotton crop by cutting off unripe bolls. *Bell*: Made their appearance in great numbers about a week since, and are destroying all gardens and every sward of grain. They have cut off the late corn and the young bolls on the late cotton. *Dallas*: Have cut short the cotton crop. *Gillespie*: The first grasshoppers arrived on the 18th of September. Three days later they left, going west, being driven by an east wind.

LABOR.—*South Carolina, Colleton*: Labor is plenty and excellent. There is no trouble in getting it if one is willing to pay for it. A plenty of good farm-hands can be had at 50 cents per day, without board.

Florida.—*Gadsden*: The necessities of the freedmen, which have been extremely stringent this year, brought out the women and half-grown boys and girls, and consequently there has been no lack of pickers. *Jefferson*: Labor is good, and not much diverted by politics from gathering crops.

Mississippi.—*Monroe*: Labor is working well, and if the weather continues favorable we will have no cotton in the fields by the 1st of November. *La Fayette*: The labor is not quite so much demoralized by the electioneering as we had feared.

INJURIES FROM DROUGHT.—*Pennsylvania.*—*Northampton*: I am safe in saying, not only that the great drought has destroyed the potatoes, grass, and corn, but the great heat ripened our wheat in a few days, so that fully one-third of the crop was lost in gathering by being shelled out and left upon the field. In nine-tenths of the county, the young clover and timothy, which had a good start in the spring, have been killed outright, making an unpromising prospect for a hay-crop next year. Many pieces of young clover and timothy look like open fallow. Such heat and drought have not been known previously within the memory of the oldest inhabitant. This has been, upon the whole, the worst season for farmers in the county since its organization, over one hundred years ago.

A NEW PROCESS OF UTILIZING COTTON.

BY THE COMMISSIONER.

Any process which will facilitate and cheapen the manufacture of cotton possesses an interest which must command the attention of the people of this country, where alone this fiber is most successfully produced. The invention of the cotton-gin was a prodigious step forward to promote the increased production and profitable employment of the cotton-planter; and now the ingenious mechanic proposes another step forward in aid of this all-important industry, by "a new process for converting seed-cotton directly into yarns;" whereby the use of the "gin" will be entirely superseded, and each step of converting the cotton, as it comes from the field, greatly cheapened. We take this mode of calling public attention to the subject, and to invite a strict scrutiny into the merits of the proposed improvement.

The following views upon this subject are presented in a letter from F. E. Whitfield, sen., of Corinth, Mississippi :

By the new process of converting seed-cotton directly into yarns only four machines are used, viz, the card, drawing-frame, speeder, and spinning-frame, (such as are now in common use ;) the card only is changed, and that slightly, by substituting an attachment for the lickerin, at a cost of about \$300.

The attachment receives the seed-cotton, gently removes the seed, combs out the dust, trash, motes, &c., and delivers the filaments, untangled, and parallel, to the card ; thus superseding the gin, press and compress, (which are only used to render cotton transportable,) the willower, lapper, double lapper, breaker, and four-fifths of the cards, which are only intended to try to remedy the injury done by the gin, press, and compress. It also saves or supersedes the railway and railway drawing-head ; also all jack-frames, slubbers, mules, twistors, eveners, &c., together with all the buildings, motive-power, and operatives to hold, drive, and attend said discarded machinery. It saves one-half the usual waste, and produces better and stronger sliver, roving, and thread than can be made of baled cotton ; thereby enabling operatives to attend more machinery, and each machine to do more work, especially in the spinning and weaving rooms. The reason why the card will do four times more by this process, using the same motive-power, is, the filaments are not permitted to leave the machinery, fly, or become tangled, but are kept straight, and carding is but the straightening of the cotton filaments. The extra strength of the thread is owing to the working of the cotton fresh from the seed, the oil of which has kept it alive, light, elastic, and flexible, with all its attenuating qualities perfect ; and to the fact that it has never been napped, cut, or tangled by the gin, pressed, compressed, or permitted to become dry, seasoned, and brittle in this tangled condition, nor has it been injured by the willower, lapper, double-lapper, breaker, and cards, where the damage done by the gin, press, and compress is sought to be remedied.

This small attachment (only 36 inches long by 18 inches wide) supersedes the above mentioned eight machines, simply because the first three are used to render cotton transportable, and the last five are intended to remedy the damage done by the first three. But these advantages, great as they are, are not half that are claimed for the new process. The ginning, seed-bagging, and ties are saved.

Take a bale of cotton on a farm near Corinth, and see the expenses, &c., incurred in sending it, via Memphis, to Boston, Mass. : Hauling to Corinth, sampling, weighing, deduction of 2 to 4 pounds from weight ; profits of purchaser, freights and insurance to Memphis, drayage to cotton-shed, storage, insurance, deep sampling, commissions for selling, brokerage for buying, deep boring, second weighing, repairs, drayage to compress, compressing, drayage to steamer or depot, freight and insurance to Boston. To these add waste, drayage, and stealage, all the expenses, speculations, and peculations of the guerrillas of the South and the great cotton rings of the North ; add also the expenses in our sea-port towns, (where it is recompressed to be shipped to Europe,) the expenses and profits of the shipment, and the expenses after its arrival there until it is sold to the manufacturer, who buys only the net cotton, (not the bagging or ties,) at his own price. For Liverpool, Manchester, Leeds, &c., take the surplus crop of the world, fix and control the price, not only there, but in every cotton mart.

Europe, China, and India pay gold for cotton and cotton-fabrics shipped from Fall River, in Massachusetts, and other places. The planter gets receipts from his merchant for a year's supply of provisions, farm-tools, &c., and is fortunate if the receipts are in full to date, (the negro, for his share, over and above his scant food and clothes, gets jew's-harps and ginger-cake.) Who gets the difference in exchange between the nations, the margin of 14 per cent. between gold and national-bank notes ? It probably is one of the perquisites of " middle-men," except in such instances as Fall River Manufacturing Company.

Now, if to all these you add the expenses, profits, &c., of the manufactured goods returned south, you will have some idea of what middle-men receive and what the new process will save to our impoverished but still beloved South land. For instance, take eight of the above twenty-five enumerated items of expense on cotton *in transitu* from the field to New England, viz, ginning, \$4 ; bagging and ties, \$2.50 ; freight to Memphis, \$2 ; commissions, \$1.25 ; brokerage, 75 cents ; storage, 50 cents ; compressing, 75 cents ; freight to Boston, \$6.25 ; total, \$18 per bale, which, on 4,200,000 bales, amounts to \$75,600,000. The item of seed is worth \$5 per bale as a fertilizer, equal to \$21,000,000, and decorticating more than doubles its value.

There can be no competition away from the cotton-fields, for seed-cotton will not bear transportation, and none other can be used.

The crop of 1875 is estimated at 4,400,000 bales, of which the South consumed about 200,000 ; the balance was shipped north and to Europe. The average price was probably about 10 cents per pound, or \$50 per bale. The enhanced value of crude cotton when converted into yarns is estimated at from 100 to 125 per cent. ; into shirting and sheeting, 200 per cent. ; into prints, still more ; and into fine muslins, 300 to 400 per

cent. These are gross profits; but, if the South made her own machinery, furnished her operatives, and fed them, they would be net to her.

The machine has run for five months steadily, giving entire satisfaction, making first quality of yarns, which sell readily in market here for 25 cents per pound, paying for seed-cotton from $\frac{1}{4}$ to $3\frac{1}{4}$ cents per pound. The only objection yet seen to it is that on the 1st of January it is necessary to hold eight months' supply of seed-cotton. This requires capital, but pays a large interest on it; for the seed-cotton lying in bulk six or twelve months greatly improves by the absorption of oil from the seed by the filaments, rendering them more attenuating or workable, giving them a rich cream-color, saving waste from flying in working, and enhancing the value of the staple fully $1\frac{1}{2}$ cents per pound, while baled cotton deteriorates nearly as much in the same time. These are facts which some have long known and profited by as planters.

The South has many and important natural advantages over the Northeast and England in manufacturing cotton, such as short, mild winters; more reliable water-power; cheaper land, building-materials, fuel, food, and labor; exemption from strikes; and direct reclamation. It would furnish pleasant, remunerative employment to her indigent women and children, (unwilling to enter the field in competition with the negro,) and, assembling them in villages around factories, would afford much greater facilities for physical, mental, and moral training of children, creating a market for edibles, and an incentive to farmers around to diversify their products.

One attachment, with the necessary machinery to convert seed-cotton into yarns put up in bales, will require 10 or 12 horse-power to drive and from six to eight operatives (mostly boys and girls) to attend it, and will work up from $\frac{3}{4}$ to 1 pound of seed-cotton per minute, or 200 to 220 pounds of yarns per day, and will cost, with royalty, \$4,500; two will cost \$7,500; and three, about \$10,000. This is exclusive of shafting, pulleys, hangers, cans, and belts.

NATIONAL AGRICULTURAL CONGRESS.

The fifth annual session of the National Agricultural Congress was held in the judges' pavilion of the International Exhibition, at Philadelphia, commencing on Tuesday, September 12, and continuing Wednesday and Thursday. Two sessions were held daily on the Centennial grounds, and evening sessions at the Belmont Hotel. Mr. W. C. Flagg, the president, was in the chair, and Professor George E. Morrow, the secretary, was in his place. An address of welcome was made by the chief of the Centennial bureau of agriculture, Captain Burnet Landreth, followed by an address of the president on "American Agriculture." In the evening the secretary spoke of the work of the congress, its opportunities, and means of usefulness. Mr. Joseph Harris, the New York farmer who combines so successfully science with practice, followed with an address on the "Outlook of American Agriculture." Wednesday morning an address on "Agricultural Statistics" was delivered by the statistician of this Department, and one on "Agricultural Reform," by Dr. Thomas P. Janes, commissioner of the bureau of agriculture of Georgia. In the absence of Dr. E. L. Sturtevant, the secretary read extracts from his address on "American Agricultural Literature." In the afternoon addresses were made by Messrs. L. F. Allen and X. A. Willard, respectively, upon "American Live Stock," and "American Dairying." Col. Thomas Claiborne, of Tennessee, delivered an address, on Thursday morning, upon "Our Southern Agriculture;" and later, addresses upon industrial education were made by President Welch, of the Iowa College, and Professor Townshend, of the Ohio Agricultural College, which were followed by discussions of the practical aspects of agricultural education. The subjects presented during the meetings were more or less thoroughly discussed, and the usual variety of business was conducted, including the election of officers, Mr. Flagg being re-elected president, and Mr. Horace J. Smith, of Philadelphia, secretary, Professor

Morrow having declined further service in that capacity. Among the resolutions passed was one presented by Professor Riley, the entomologist, favoring the organization of a commission for investigation of the grasshopper plague.

At the request of the Commissioner of Agriculture, the address of Mr. Allen has been forwarded for publication. It is entitled

AMERICAN LIVE STOCK.

The subject on which your executive committee has invited me to address you, viz, "Our live stock interests, in their history, condition, and prospects," is far too broad in its scope to be compressed within the limits of an address on an occasion like the present. Indeed, it can only be treated in a manner suggestive, rather than practical, or even historical.

The history of the live stock of the United States, from the first settlement of our Atlantic seaboard to its present wonderful expansion to the shores of the Pacific, would be almost a history of the people themselves, so close has been the association of their domestic animals with the fortunes of the agricultural population. The limits of this paper will only allow me to touch on the introduction of our domestic animals, and follow them briefly for about two hundred and fifty years of progress into their present condition and prospects for the future.

It is a very broad subject—the entire category of our farm-stock—embracing the nobility of the horse; the utility of the ass, and the hybrid offspring of both, the mule; the branches of the bovine race: the cow for milk, the ox for labor, and the bullock for beef; the sheep for its flesh and wool; the swine for flesh, lard, and oil; not omitting poultry, and even the "little busy bee," which contributes to our household comforts and luxuries. You will therefore excuse the brevity of my remarks in each department, as any questions suggested may more fully be studied by reference to the many able works devoted to different branches of this interest.

First in order may be mentioned

THE HORSE.

His domestic history is coeval with that of mankind. He has contributed in no small degree to man's civilization. The most ancient of human annals, both sacred and profane, have eulogized him. His prowess has been extolled in histories of war; in domestic servitude his indispensable labors have been gratefully acknowledged; in luxury he is an indispensable agent, and altogether the noblest animal ever under human control.

The first introduction of the horse to the vast territory now comprising the United States of America was in all probability made by the Spaniards on the coast of Florida, some years previous to the settlement of the early English and other European colonists on our Atlantic shores. History gives us little or no account of the breeds and characters of those early importations. The Florida Spaniards came out chiefly as gold-hunters, and what horses they brought with them were in all probability of the Andalusian or ordinary Spanish race, which were for many centuries bred by the Moors in Spain, and subsequently by their Castilian conquerors. Those horses were small in size, good in draught and under the saddle, hardy in constitution, and capable of undergoing great fatigue with negligent treatment; in fact, the most useful class of animals for them and their successors. Without much, if any, improvement, they now plentifully inhabit Texas, California, New Mexico, and Mexico proper. They do not really belong to the class "American horse," as we now understand that classification.

The settlers on our Atlantic coast, beginning about the year 1616, brought out the horses of their own native countries; Holland, Great Britain, Ireland, Sweden, Denmark, France, and Germany being thus laid under contribution. Great variety of character was thus introduced, and as their importers were men of narrow means, the animals were probably not of the choicest kinds, either in blood or quality, but very useful in the rude agriculture of the time. As these horses shared the hardships and privations of their owners, no marked improvement could be effected until the introduction of superior animals by later immigrants.

As the colonies grew in population and strength, attracting increased attention from the English government, under which they were all ultimately combined, immigrants of wealth, official dignitaries, and army officers brought out many valuable horses, some few accounts of which date back to the year 1700. Among them were choice specimens of the draught variety, as well as saddle-horses; but the roadster, as we now know him, was then undeveloped, from the lack of good roads and light vehicles. Within a few years, however, after 1700, several fine blood horses of both sexes were

known to be imported into Virginia, New York, and other States both north and south, many of the earlier and later immigrants of those States being great admirers of horse quality. These later importations were closely interbred and widely distributed, and crossed on the common mares of the country. Thus a rapid improvement was made in the style and appearance of our horseflesh generally, as well as in their superior utility and value. So marked was that improvement that at the outbreak of the revolutionary war our military officers were usually equipped with horses of superior blood, quality, and action. Indeed, many of the brilliant achievements of our revolutionary army owed a share of their success to the thorough mounting of the cavalry, and the excellence of the horses ridden by the commanding and staff officers of the foot divisions and corps.

Recovering from the calamities and poverty of the war, as the circumstances of our people improved, the study and cultivation of their horses rapidly increased, and the earlier years of the present century produced many animals which, in high breeding, style, and execution of their work, equaled those of any other country, either on the race-course, under the saddle, in the harness, or the draught.

A brief notice of the various classes of horses now in approved use and cultivation among our American people may be germane to the subject; and first in order may be named the

ENGLISH THOROUGHERED, OR RACE-HORSE.—As originally introduced into the American colonies, and since continued in our States, he has been the foundation of the highest excellence yet developed for all ordinary use, aside from the heavy and slower draught. About two hundred years ago, during the reign of Charles II, the race-course first began to attract the attention of the nobility and other wealthy aristocracy of England, and it has been continued down to the present time. As a consequence, speed, bottom, hardiness, and endurance were the qualities chiefly sought in the development of the race-horse. For centuries previous they had fine horses in England, yet they needed improvement, if possible, and choice selections were made from Egypt, Arabia, and the Barbary states for stallions, and sometimes mares, to infuse their good qualities into the English blood. Many crosses of foreign stallions were made on the native English mares, and no doubt decided improvements were derived from their use, but, after all, the size and more muscular qualities retained by the descendants of those crosses were mainly of the original English character, and have been perpetuated both in England and America to the present day.

Late in the last century, and occasionally down to recent years, we have received importations of choice stallions from Asia and Africa, near the Mediterranean coast; but in justice I must remark that although some of them were of the highest symmetry in form, action, and appearance, yet when crossed upon our well-bred mares, a superior impress on their descendants, except in few instances, has not been eminently noticeable. Did time permit, I might go into particulars within the limits of my own observation, but the fact must remain with only a general remark of its truth. Whether the thoroughbred horse in the United States has been kept up to the standard of excellence at which he has arrived in England, or improved beyond him, an instance or two may determine. I have been unable to learn the best running-time of the race-horse in England, and therefore a current comparison between the speed of the American and English horse cannot be made.

In the great national four-mile race of three heats, on Long Island, N. Y., in the year 1823, between the stallions American Eclipse, bred on Long Island, N. Y., and Henry, bred in Virginia, the first heat was taken by Henry, by a head only, in 7 minutes 37½ seconds. The other two heats were taken by Eclipse in 7 minutes 49 seconds and 8 minutes 14 seconds, yet it was never exactly known what was the very best time Eclipse could make, only when matched with a nearly equal competitor, as he was called a lazy horse, and bore the whip freely.

The Kentucky-bred stallion, Lexington, on the New Orleans four-mile course, in the year 1854, won his race in 7 minutes 19¼ seconds.

Fellowcraft, also a Kentucky-bred stallion, won a race on the four-mile course at Saratoga, in the year 1874, in 7 minutes 19¼ seconds. These are the two shortest races ever made, so far as records are given, thus leaving the American thoroughbred the peer of any others in the world.*

We may well suppose that the superiority of the thoroughbred horse in the combinations of speed, action, wind, bottom, and fineness of proportions has been fully determined, and that an infusion of his blood would be sought and worked into a large class of our miscellaneous-bred horses for other purposes than the race-course, or simply the gratifications of taste and pleasure. Among the most notable class of the thoroughbred crosses upon the better ones of miscellaneous character, is

THE AMERICAN TROTTER, which we claim as solely an American production, within the last forty years, in the highest development of his speed. A detailed history of

* Since the above sentence was written, the horse Tenbroeck made a race at Louisville, Ky., in 7 minutes 15½ seconds, beating Fellowcraft 3¼ seconds.—L. F. A.

the trotter would require many pages, for which no time can here be allotted, and the horse literature of the country only can give it. Suffice it to say, however, that his descent has been largely drawn from the thoroughbred for many years back in his ancestry.

Trotting horses of celebrity have been recorded in the English periodicals of years ago, particularly Bellfounder, who trotted 19½ miles in an hour; but in the trotting horse, classed by himself, England, as compared with America, has yet made no distinguished record; and that the American trotter has been most skillfully bred and trained to his recent astonishing achievements is a testimonial to our native enterprise beyond that of any other country. Thirty years ago, a horse that could trot a mile in three minutes was considered a remarkable animal. That three minutes has been gradually reduced from year to year, until, in 1875, the mare Goldsmith Maid, at eighteen years of age, made her mile in 2 minutes and 14 seconds, and repeated it in the present year, 1876, in the same time. We now have scores of horses which make their mile in less than 2½ minutes on the trotting-courses of the country, as well as hundreds of them who easily do their mile in 3 minutes speed. Thus the American trotter stands at the head of his class over all others in the civilized world, as yet discovered.

If it be inquired in what remarkable manner the rapid speed and high qualities of the trotter have benefited the ordinary horse stock of the country, the answer is readily given in the fact that our better class of driving horses has been wonderfully improved in action, as well as in quicker movement, sureness of step, higher pleasure to all who either drive or ride after them, and in the increased marketable price they obtain for their breeders.

Next in order we may remark, in the absence of a more appropriate name, upon

THE HORSE OF ALL WORK, equally adapted to family use, the labors of the farm, or other purposes. I doubt if any part of the world, climate and soil considered, can show a better class of horses than those bred in the United States and the neighboring province of Canada. Made up of no particular breed, but an infusion of different bloods, they answer an admirable purpose for almost all uses, so far as size, endurance, muscular action, and longevity are concerned. A composite breed they may be called, if such a miscellaneous admixture can be called a breed at all. They are of all colors and all sizes, from fourteen and a half to sixteen and a half hands high, and weigh nine to twelve or thirteen hundred pounds in fair condition of flesh. They are bred and reared by all good farmers who make horse-rearing a branch of their industry, and are bought and distributed all over the country, in village, town, and city, where, aside from mere fancy use, the horse is needed. Good stallions are kept for service in almost every neighborhood of the land, and of these the horse-breeder takes his choice for service to his mares, and succeeds in their production as his skill and care may determine. There is another example of the value of our horse of all work in Great Britain, which can boast as good horses, of their kind, as any part of Europe. Since the street rail-car has been introduced into Great Britain, within the past year or two, it has been found that they had no class of horses especially fitted for that work. It required the sinewy, elastic movement, coupled with the medium size and endurance in our all-work horse. As a consequence, many hundreds of American horses have been purchased in our northern States and Canada for export to Britain, for other purposes as well as for street railways, and the trade is still continued to the mutual advantage of both countries.

Another class demanded for exclusive purposes is

THE DRAUGHT-HORSE, PROPER, needed for heavy farm labors, and drawing the weighty loads in our commercial and manufacturing cities and towns, for which the ordinary horse of our farmers is incompetent. Of this class, if we have any which may be called "ancient" among us—say a hundred years or more—first in order stands the *Conestoga*, of Pennsylvania. The name is a local one, taken from a river of the central part of that State. He is supposed to be a native of Flanders, and to have been introduced by the German immigrants soon after they settled in Pennsylvania some time in the last century. This horse is still reared in Pennsylvania, but in smaller numbers than formerly, and in several other States, and is a decided favorite with those who breed and use them. Nearly or quite a hundred years ago, when the settlements of that State had extended westward over the Alleghany Mountains, when towns began to spring up, and heavy transportation between them and the seaboard became necessary, the huge canvas-covered wagons, carrying six tons and upwards of merchandise, were drawn by spans of four to eight horses, with sometimes a ninth one in single harness as a leader. Those horses ranged from sixteen and a half to seventeen and a half hands high, with bodies solid and bulky in proportion. Long before canals and railroads were known in our country, caravans of those teams were daily seen at all seasons of the year traversing the roads over the mountains between Philadelphia and Pittsburgh, and with bear-skin housings upon the hames, and an arch of bells above them, with the driver seated on the near wheel-horse; a more picturesque spectacle of the kind could rarely be imagined. Their usual rate of travel was about twelve to fourteen miles a day. But those caravans, since the construction of rail-

ways, have mostly passed away, and the descendants of the stately teams are now devoted chiefly to agricultural uses, and the drays and wagons in the cities. It is doubtful if a better class of heavy draught-horses than they have ever existed. It is claimed by some writers that the *Conestoga* has been bred to his high degree of excellence by crosses of the thoroughbred English horse, but without sufficient evidence of the fact, as for the last seventy years he has developed no trait of the blood-horse in his composition, and in his characteristics has adhered solely to the type of his original progenitors.

Other foreign breeds of the draught-horse of decided excellence have in later years been introduced among us, and are much approved. Among these may be named, in the order of introduction, the *Clydesdale*. This horse is of Scottish descent, of the largest size, seventeen to eighteen hands high, with a ponderous body, stout limbs, hairy at the fetlocks, of high and noble carriage, and unsurpassed in weight and strength. They occasionally reach a weight of seventeen, even eighteen hundred pounds. They were first introduced by the Scottish farmers into Upper Canada, where they have been bred in considerable numbers and are still annually imported. There have been also some direct importations from Scotland to the United States. Many of the Canadian importations have found their way into several of our States, where, for heavy agricultural and other draught, they serve a valuable purpose.

The *Suffolk Punch*, so called, is a draught-horse of English breeding and descent. He is of large size, but smaller in bulk and stature than the *Clydesdale*, somewhat similar in style of body and limb, but without the hairy fetlock. A few of them have been imported into Canada and the United States, but have not yet acquired the popularity of the *Clydes*, although of decided excellence and a model of their kind.

There are two other classes of draught-horse introduced into our country, somewhat similar in character and probable descent, and may be classed in nearly a parallel category.

The *Normans* may first be named as earliest in importation. They are natives of France, not of like style altogether with the draught-horses already named, as they embody more speed in action, with great strength of limb and power of locomotion. They are largely worked in the heavy diligence traveling-carriages of France, which they move at five to eight miles an hour on the roads, holding a good trotting gait. They are also used for drawing heavy loads in the cities and towns and in agricultural labor. Their usual size is sixteen to seventeen hands in height, compact in body, symmetrical in shape, clean in limb, hardy in exercise, and enduring in labor. The stallions have been of decided service in crossing with our mares of "all work," as well as in breeding with mares of their own kind; for the mixed uses to which they may be applied are a valuable addition to the horse-stock of the country.

Next to and partially associated with the *Normans*, may be named the *Percherons*. As a rule, they are somewhat larger in size. They are also natives of France, and applicable to the same uses as the *Normans*, and of equally good shape, style, and appearance. They have been considerably imported into several of our States, of late years, and received with approbation among those who need a beast of their kind. They may be pronounced a decided acquisition, and it is to be hoped that the enterprise of their importers may be liberally rewarded. From the numbers of both sexes now here, a healthful production of their kind, both in general excellence and purity of blood, may be anticipated.

Nor in our horse category should the lesser, and even diminutive *Pony* be overlooked. For a century or more past they have been imported into the United States, of different character and style, from the Welsh and English pony of twelve to thirteen hands, down to the diminutive little *Shetland* from the northern isles of Scotland, of three feet or less in stature. They are usually symmetrical in shape and appearance, of wonderful strength, docility, hardiness, and endurance. Although of little use as laboring beasts, they minister largely to the pleasure of our families, are the delights of our children, and worthy of attention and propagation as innocent promoters of luxury and enjoyment. Under proper care and attention they thrive as well in America as in the countries from which they came to us.

THE ASS.

This useful and indispensable animal—useful in mule-breeding as well as in the propagation of his own species—is among the most important items of our farm-stock, and worthy of a discriminating notice. On the eastern continent their utility is of as ancient date as that of the horse, and among many nations and peoples their labor is indispensable. They were early brought into our American colonies, and from their first introduction until some years of the present century were widely used in the Atlantic, Northern, and Middle States for the propagation of mules for the West Indies and our southern domestic markets. Since about the year 1820, mule breeding and rearing in the Eastern States being superseded by the cheaper facilities for producing them in several of the more western States, the ass has ceased to be either an article of breeding or commerce where they were first imported, and is now rarely known

within their boundaries. Yet in the localities where now most used, he has been improved both in size and quality. Numerous importations have been made during the last seventy years, from Spain, Malta, and other adjacent countries, of the best blood of his race, and their produce, bred on the females of American stock, have so improved them that we can now exhibit the domestic ass as equal, if not superior, to those of any other country. Would time permit, we might even go into particulars, to prove our assertion, but it must now suffice to state the fact in general terms. With us he is rarely used as a laboring beast, his services being superseded by the mule, as our country is happily free from that low class of labor in which his drudgery is needed.

THE MULE.

The origin and history of this peculiar animal is almost as ancient as that of his progenitors, the ass and the horse. He has ever been useful in the industries of the people of many nations, both ancient and modern, and to the development of certain branches of our American agriculture, traffic, and commerce he is widely appropriated and indispensable. The early mules of the Eastern States were small in size, seldom attaining a height of more than fifteen hands, and usually less, yet of great strength in labor, endurance, and longevity; but the western mule has far exceeded him in size, weight, and adaptation to the heavier work demanded of him. It is now not uncommon to find him sixteen, even seventeen hands high, with a body in proportion, and frequently a comeliness in form exciting the admiration of those who are partial to his employment. His uses in the various labors demanded of him are so well known that it is unnecessary to name them; and in comparing him with the mules of other countries, it may be truthfully said that the American mule has no superior, and but few equals, and thus constitutes an important staple of our agricultural wealth. A proper history of the progress and present condition of either the American ass or mule has never yet been written for publication other than in detached scraps or pamphlets, yet they are subjects well worthy the employment of an able pen, and it is hoped that such a labor will be undertaken by some one fully competent to its execution.

AMERICAN CATTLE.

To give a history of the rise, progress, and present condition of this important department of our industry would be to write an elaborate book, the like of which was written some four years ago; but it has fallen, I fear, too seldom under the notice of those whose interests would be promoted by its perusal, even under its shortcomings and imperfections. However that may be, I shall briefly, yet as accurately as my observation may allow, give some notes and suggestions on their very wide importance. Neat-cattle, in the sense usually understood with us, or, more strictly, animals of the bovine race, were introduced into all our Atlantic States soon after the first settlers came over from Europe. Those settlers brought with them animals reared in the vicinities from which they themselves came, of various nationalities. Their cattle were of no particular breeds or distinctive names, that we have learned, but such as served the wants of the settlers in the production of milk, the propagation of their kind, their meat for food, and their labor for agriculture—animals of a common order only, as improved breeds in those days had not received much attention in the countries from which the immigrants came. Anterior, however, to the colonial settlements in what are now the United States, the Spaniards had introduced many cattle from their own country into the territories of Mexico and further south, and in the broad, luxuriant pastures of those regions they multiplied into numerous herds, with little attention to their improvement, as they are now found and known; but of late years, since the annexation of Texas, New Mexico, and California, they have become quite an article of commerce and consumption in other States.

In nearly all the grass-producing or grazing portions of our older States, as the people progressed in their modes of agriculture, their cattle, increased and multiplied, were usually well cared for, and answered all the purposes demanded of them. In some sections of the country they were better cared for than in others, and possibly improved in quality over the originals from which they sprung; yet as the settlers, after some years, began to migrate to different localities, taking portions of their herds with them, the cattle became intermixed with those derived from other nationalities, so that in process of time a general intermixture took place, and the name "common cattle" was only known in their application. This name is now continued to distinguish them from the improved breeds of later years.

Occasionally, and at different times in the last century, tradition has informed us that enterprising men of wealth had imported some choice cattle of "improved" blood from Europe—the names of the breeds not remembered—but they were so few, and so little attention was paid to their propagation in their own distinct lines, that they soon became amalgamated with the common stocks. Yet that the infusion of their blood

among the others to some extent made their progeny better than the older herds we have good reason to believe, particularly as the working oxen of the Eastern States, and their superior dairy cows, for some generations past, have been held in high estimation. This assertion may, however, be qualified by saying that the oxen were chiefly used in labor on the farms, and the dairy formed a considerable staple of their agriculture, consequently drawing closer attention to the cultivation of their cattle. In the more fertile soils of the Middle States, which were chiefly grain-growing, horses were used for labor and cows in the dairy mainly for domestic consumption, while the steers and bullocks grown by them were for meat purposes, or, if for labor at all, only for a few years, until the forests were subdued and the land made clear for horse cultivation.

BREEDS OF CATTLE.

Of improved cattle we now have several valuable and distinct varieties. A few remarks on each of them must suffice; and first in order, as they are by far the most numerous in attracting the attention of our farmers, breeders, and graziers, I name the

SHORT-HORNS.—Soon after the revolutionary war, and previous to the year 1800, a few animals of this breed were imported by two different Englishmen into the city of New York. The fact of their importation is the chief thing known about them, as only a few results are now recognized from their breeding. One of the imported cows was taken back to England—"the American Cow," so called, of the English Herd-Book—from which, afterward, many noted and valuable animals descended. About the same years, also, two different importations of cattle, supposed to be Short-horns, were made from England into Baltimore and taken to the valley of the south branch of the Potomac River, in Virginia, and from there, within a few years afterward, some of their descendants were driven to the blue-grass region of Kentucky, where they were carefully propagated, and in after years, crossed by bulls of still later importations, became an important item of the cattle-wealth of that State.

We hear of no further Short-horn importations until after the war with England, in 1812-15. Soon afterward, several importations of them were made into New York, Massachusetts, Kentucky, Maryland, and Pennsylvania. They were industriously bred by their enterprising owners, and the valuable qualities of their own distinct blood, and the improvement through their crosses upon the common cows of the country for most useful purposes, soon gave them a popularity and dissemination attained by no other breed, and since followed by numerous importations into many of our States and the Canadas. They now stand largely in excess of numbers over all other foreign breeds put together. The various merits of this breed it is not now necessary to discuss, as different opinions may be entertained regarding them, but the fact may be stated that their recorded pedigrees in the Herd-Book now number more than 60,000 well-bred animals, and at the present time they are increasing more rapidly than at any previous period in their history.

DEVONS.—This is a strikingly distinct breed in form and quality, medium in size, uniformly red in color, comely in appearance, and of decided excellence: the ox for labor, as his agile form indicates; the cow for milk, when cultivated for that object, and the uniform excellence of their flesh when properly fed and matured. Nor can there be any doubt of the original distinctive blood of the Devon. Their advocates in England claim them to be as ancient in blood and descent as the Roman rule in that island, many hundred years ago; but by what evidence, other than in their peculiar style of form and character, is not known. That animals allied to them in blood were brought to America from England so long ago as in the seventeenth century is altogether probable, as many of the native New England cattle, for many generations back, have borne strong resemblances to the Devon in some of their characteristics.

The first authentic knowledge we have of thoroughbred Devons being imported to our country was in the year 1817, by Messrs. Caton and Patterson, of Baltimore, Md., and in the next year by the late distinguished statesman, Rufus King, of Long Island, N. Y. By those gentlemen they were bred and cultivated, and herds from them considerably disseminated in different sections of the country. Later importations of them have been made into Maryland, Massachusetts, New York, and some other States. There are now several fine herds of them existing in different sections of the country, but, we regret to say, not in the numbers which their good qualities should command, but of excellence quite equal to the original importations. It is hoped that they will still further increase, until they become numerous among the standard breeds of our country.

HEREFORDS.—Next in order of improved cattle this breed may be named. The first distinct account we have of thoroughbred ones of the kind were an importation by the great Kentucky statesman, Henry Clay, in the year 1816. An ardent admirer of fine stock, he saw them in England in 1815, and purchased two pairs of bulls and cows, which afterward came out and were placed on his farm at Ashland, near Lexington.

Whether any or what number of thoroughbred produce came from them, we are not informed, as no record was kept, and they are not now known in Kentucky. The bulls were bred to some of the native cows in their vicinity, but the Short-horns, which were imported there soon afterward, superseded them in propagation, and we hear nothing further of their produce.

About the year 1824, one or more Hereford bulls, and perhaps a cow or two, were imported into Massachusetts. We here of no thoroughbred produce from them, but the bulls were bred to a limited extent on common cows, and no marked result followed, except some grand working oxen, afterward fed into excellent carcasses of beef. In later years, a few importations of choice animals were made into New York, Ohio, and Upper Canada. Their descendants have been scattered in small herds into several States, but, we regret to say, not with the popularity which such excellent grazing and beef-producing animals merit. As flesh-producers they strongly rival the Short-horns, and in size nearly equal them. They are mainly red in color, with white or mottled faces, and occasionally white legs and bellies, and stripes along the back. In England they are claimed as an ancient breed, and their distinctive uniform appearance well bears out the assertion.

The three English breeds already named may be classed as the best flesh-producers. Next in order may be named the breeds more distinctly used for dairy purposes: the **AYRSHIRE**.—This is claimed as a dairy or milking breed, and wherever known, either at these native homes in Scotland or in their later ones in the United States, are esteemed and cultivated for that exclusive purpose. They are said, by authentic history, to have been originated about a century ago in the district of Ayrshire, whence the name was taken, by a cross of Short-horn bulls from the north of England on the common or native Kyloe cow of Scotland, and cultivated into their present excellent dairy qualities by careful and persistent breeding, until their characteristics have become fixed and enduring. They were first imported in small numbers to America between the years 1820 and 1830, as nearly as can be ascertained, and within the last thirty years in such numbers as now to be found in many considerable herds. They are highly esteemed by those who are partial to them for their large yields of milk, which render them much more profitable for dairy uses than the common cows of the country. In size they are about equal to our common cattle; in color, usually red or brown, more or less mixed with white; in shape, more like the Short-horn than any others, although lacking their fine contour and comeliness of appearance—a valuable breed of cattle.

HOLSTEINS, OR NORTH HOLLANDS.—This breed, in its present characteristic of great milk-producing quality, has been introduced here within the last twelve or fifteen years, from Holland, and first, we believe, imported by the late Mr. Chenery, of Boston, Massachusetts. They are of large size, nearly equal in weight and bulk to the Short-horn, and have some of their strong points of character, but coarser, less refined in figure, and black and white in color. For the few years in which they have been on trial here, their dairy development has been remarkable in the *quantity* of their milk. As a flesh-producing beast they are claimed to be good, but the economical result in their consumption of food to weight of flesh has not been thoroughly solved. They are unquestionably good cattle, far superior to our native cows; and when sufficient time has passed to develop their full qualities, they may stand in the first class of dairy cows. They are evidently of an ancient stock, originating possibly in Holstein or North Holland, and may in some branches of their ancestry have had an affinity with the far-back, unimproved Short-horns, although in color and general appearance now much unlike our Short-horns of the present day.

Last, but not least in importance, may be named the **ALDERNEY, JERSEY, AND GUERNSEY**, from the Channel Islands of Britain, near the coast of France. These breeds or varieties are named together, as they are unquestionably of common origin, and owe their present distinctive qualities in appearance to their manner of breeding, and the tastes and preferences of their long-time propagators. That they are an ancient breed there can be no doubt, probably French in origin, as the cows of the provinces of Normandy and Brittany bear a considerable resemblance to them; but isolated as they have been from the mainland of the continent during the centuries of their cultivation on the islands, they have assumed the characteristics which so readily distinguish them. In size they are smaller than our native cows, delicate in form, unique in shape, diversified in color, and bloodlike in appearance. The prime quality claimed for the cow is the exceeding yellow color and rich quality of her milk, cream, and butter, in all which she stands without a rival, although her quantity of milk is moderate, compared with the weight of butter which it yields. For the production of meat, the Channel Island cow, or even bullock, (when ever suffered to become a bullock,) is inferior, the anatomy being angular, and not capable of making much flesh in the choicest parts of the carcass. Within the last thirty years they have been numerous imported into our States, and are much sought in the vicinities of our large cities, towns, and villages as family cows. They are easily kept in small paddocks or close stables, where their rather delicate natures can receive the attention, kind treatment, and choice food usually bestowed upon them.

For all these improved breeds herd-books containing their genealogy, by way of pedigree, are kept in the United States, as well as in their native countries, and from them a full knowledge of their descent and blood is readily obtained by all who choose to inquire into their breeding. Prices might be quoted of the sale values of several of these breeds of cattle—some of them seemingly extravagant in amount—but such statistical reference is not demanded in this limited discourse, rather leaving it to the tastes, judgments, and fancies of those interested in their breeding. The introduction of these improved breeds has added enormously to the value of the neat-stock of our country, and their farther dissemination is yet to add untold millions to its productive agriculture. Slow as farmers, cattle-breeders, graziers, and dairymen have proverbially been in the improvement of their herds, a rapid and more intelligent interest is every year manifested in their increase.

In addition to the breeds of cattle already named may be a few others of foreign origin introduced at different times by way of experiment or personal gratification; but as they have taken no strong hold on the attention of our stock-breeders, a further notice of them may be omitted, while in the grand specimens of the various breeds which have been mentioned we may assert, without contradiction, that no country in the universe contains better herds than the United States of America can now exhibit.

The subject of our neat-cattle can hardly be dismissed without an allusion to an important item of their increasing value in *fresh-beef exportation*, which has recently been developed by the demand for fresh carcass meat from abroad, particularly in Great Britain. Refrigerators have been fitted up in Atlantic steamships, and, by the aid of ice, many tons of beef, in quarters of the carcass, have already been, and unlimited tons more may continue to be, transported to Europe with entire safety, and in perfect freshness. The prices for which it has been sold in the London and Liverpool markets have proved equal to those for the best qualities of their native beef, and profitable to the shippers. There is, however, a condition attached to our successful exports, which is, that the meat be of the best quality, and that quality can only be obtained from animals of improved breeds which have been partially described. We have only to proceed in the cultivation of those breeds, in order to add a wide, almost illimitable, field of production to the neat-stock interests of our country.

SHEEP.

These were early introduced into our American colonies as companions of the horses and cattle brought by the settlers. They were of the kinds then common to England, Scotland, Ireland, and perhaps the western coast of the European continent, of various breeds, as they then locally prevailed, but without much merit, other than a tolerable carcass of ordinary flesh and a moderate fleece of coarse wool. They were so kept and propagated, with possibly an occasional importation of a better kind from England, but it was not until late in the last century that Bakewell, Ellman, and other enterprising breeders made their experiments in different breeds which resulted in any considerable improvement in their condition and appearance. Thus the American sheep were chiefly of an inferior character.

MERINO.—In the early years of the present century the American ambassadors at the courts of France, Spain, and Portugal, during the intense commotions of the Bonaparte wars, purchased and shipped to the United States many hundreds of Spanish Merino sheep. They were of the fine-wooled varieties, named as you will find in our books on sheep-husbandry. Their introduction here was hailed with great satisfaction, and as our infant woolen manufactories were then just emerging into existence, great importance was given to their propagation, not only in their own purity of blood, but as valuable crosses on our common flocks in increasing and refining the qualities of their wool. From those days forward to the present time the cultivation of the better qualities of wool has been the study of numerous flock-masters in various parts of the United States, suitable to their rearing, and the sheep interest now presents an important branch of our agricultural production and wealth. The Spanish Merino has evidently been much improved in its American cultivation, not only through the crosses of more recent importation by several of our enterprising Americans from the royal flocks of France, Saxony, and Silesia, upon the earlier Merino ewes, but by our own flock-masters at home, so that at this day no fine-wool sheep in the world excel, and few equal, the *American Merinos* in the heavy products of their fleeces, or the size and stamina of their bodies. We might examine the statistics of their annual production aggregating millions of dollars in value did time and opportunity permit, but we may rest content with the general facts which have been stated and the progress we have made in their cultivation, not only in the fine wool but in the other varieties.

THE COARSER-WOOLED MUTTON-SHEEP, so successfully bred in England during the last seventy years, we have for the past thirty years adopted by frequent importations. They have been successfully propagated in their own purity of blood, and by their crosses on the common flocks raised our inferior ones to a value hitherto unknown

in their kind. We have now the Bakewell, or Leicester, the Cotswold, and Lincoln, all of the most valuable long-wool varieties. We have also the Southdown, the Shropshire and Oxford Downs of the middle wools, abundant in fleece, massive in the quantity and delicious in the excellence of their flesh, so that Americans may, within the next decade or two, become, as they have never yet become, a partially mutton-consuming people, and ship thousands of dressed carcasses to Britain, as is now done with our fresh beef.

SWINE.

In the category of other domestic animals brought into our country with the early immigrants came also this animal indispensable for domestic consumption, constituting an important item in our exports abroad. From the earliest history, swine have been connected with farm-husbandry, as well as untamed rangers of the forest, in which latter condition they even now exist in some of the uncultivated sections of the eastern continent. To what degree of perfection, or even improvement, they were cultivated in ancient times, history gives us little or no account; but we do know that for many years previous to the present century, and for some years since, the common swine of the United States were inferior in the quality of their flesh, ungainly in form, slow in arriving at maturity, and repulsive in almost every phase of their character as companions to our other agricultural stock. Yet in Eastern Asia, and in portions of Europe, perhaps for a century or more past, considerable advances had been made in the improvement of their domestic swine, as a few years after the revolutionary war, importations of improved animals of the kind were introduced into our country, and among them we have accounts that General Washington had some of them which were sent over as a present to him at Mount Vernon, from England. Early in the present century, also, the East India merchants of Massachusetts and New York imported some fine specimens from China and India, which were afterward considerably crossed on the common stocks of our Eastern States, and much improved them both in the qualities of their flesh and domestic habits. Still, until within the last fifty, or even forty years, the mass of our farmers throughout the country, and more particularly in the Western States, bred and reared swine of ordinary character, answering, to be sure, the main requirements of consumable flesh, but inferior in its high condition to that now found in our markets, either for domestic consumption or exportation.

The various foreign breeds to which we are indebted for our present swine improvement are too numerous to mention, and their history in detail, although quite interesting, is too long to narrate, but the agricultural literature of our several States will fully inform all inquirers of their various progress and present status. As an evidence of the present interest in their production and improvement, an association of swine-breeders has recently been formed, whose headquarters are at Springfield, Ill. They have issued a swine herd-book for the Berkshire breed, after the style of the various cattle herd-books, in which their genealogy and high excellences are chronicled. Not that we would exalt this particular breed above others, perhaps equally meritorious, but to signalize the enterprise of our farmers, and the magnitude of the pork and lard-producing interest of our country, amounting to hundreds of millions of dollars annually. The swine of the United States now consume a great share of the product of the almost illimitable corn fields of our Western and upper Southern States, thus converting a great portion of that valuable grain into a portable commodity, which, without them, would be either a drug, or an almost inconvertible staple of their agriculture. We may, in view of the progress we have made in swine cultivation and improvement, place the United States superior to that of any other country in the world.

POULTRY.

To descend to a smaller, yet quite indispensable, item of food consumption in our households, as well as ornamental accompaniments of domestic life, the varieties of our poultry may well and profitably be mentioned. They, too, (the turkey excepted,) came over with the early settlers of our American colonies, and have been the intimate associates of our people ever since. They constitute an important part of the luxury of our tables, both in their flesh and eggs, the aggregate commercial value of which, were it accurately reckoned, amounts to millions of dollars annually. The poultry literature of our country is voluminous, both in books and various agricultural periodicals, to which those in search of information may readily refer. As a general remark, it may suffice to say that importations from foreign countries, of various breeds of them, have been frequent and of rare quality, both in the estimation of the economist who propagates them for profit, as well as the amateur, for the gratification of his taste in their selection and exhibition. Poultry societies have become numerous throughout the land, and the annual exhibitions of their various specimens have been marvelous in excellence, beauty,

and variety. The cultivation of the finer varieties has arrested the attention of men and women of taste, wealth, and refinement to such extent that the perfection of our poultry may even be classed among the fine arts of animated nature, and challenge competition with any portion of the universe.

Least and last of the domestic creatures which engage our attention may be named a small insect,

THE HONEY-BEE.

Time, long before and ever since the bee made its honey in the carcass of the dead lion slain by Sampson, has noted this useful insect in its companionship with man, as well as in its wild habitations in the wilderness, where climate and vegetation favored its propagation. It furnishes us the most luxuriant of sweets in its honey, and an important commodity in its wax. The aggregate annual commercial value of our bee-product is probably hundreds of thousands of dollars, being difficult to determine, from the want of current statistics; yet all who choose to investigate may be assured of their importance. Of bee literature, we have public journals devoted to their interest, many volumes of printed books, and divers essays in our agricultural periodicals; and were I to relate the annals of my own personal companionship with them for many years past, I should only tell you that at the present day they are both as untamed and uncivilized as when the great patriarch, Noah, let them out of his ark to forage among the renewed plants and flowers at the foot of Mount Ararat. They live, propagate, and subsist by *instinct* alone, and not all the invention or ingenuity of man has been able to improve their qualities, to change their habits, or invite them to a companionable docility. Even the importation of the superior Italian bee into our country in late years, and crossing them on our common stock, has not perceptibly improved their habits. So, lovable as they may be in their sweets and wax, they are barbarians now, as ever, and equally at home in the hollow trunk of a tree in the wildest forest, as in their hives amid the flowers of the field, or the refinements of the mossy highly cultivated orchard and garden.

Now, gentlemen, in all this long dissertation I have probably told you nothing new, and little which will prove instructive, or even worthy of publication. Yet we have seen that from the rudest material at the beginning of our agricultural settlements we have made decided progress in the breeding and cultivation of our domestic animals, and that chiefly within the last century. We find that much has thus far been accomplished, and with the aids and lights now at our disposal, we trust a still more rapid and a more widely disseminated progress can be achieved in the future.

The present value of all our varieties of domestic live stock in the United States and its territories may be safely estimated at two thousand millions of dollars, and their annual product of all kinds at one thousand millions more. Full 30 per cent. has been added to the aggregate *per capita* value of our *graded* stock by improvements in their breeding within the last fifty years, and at no increased cost in their keeping, although those improved animals as yet extend over only a fractional part of our country. What then may be the increased measure of value when—if such a thing be possible—that improvement shall embrace the farm-stock of our entire broad nationality? It must be almost incalculable.

In review of this live-stock history and progress which has been considered, I wish here to note, and with somewhat of emphasis, that, with the exception of our finer classes of horses, the breeding, rearing, and cultivation of our farm-stock has been hitherto considered, by those not intimately acquainted with it, as an occupation of a rather vulgar order, and conducted by men of duller intellects than those engaged in professional, scientific, commercial, or manufacturing pursuits. Such a supposition is a profound and ignorant mistake, based only on an entire misapprehension of the study of animal physiology. The cultivation of domestic animals, and their improvement, through generations of their kind, into the admirable specimens which we now see, is as much a branch of the fine arts, applied to animal physiology, as are the superb specimens of statuary and painting which you to-day witness in these Centennial rooms, produced by the successors of Phidias, Michael Angelo, Raphael, or Claude Lorraine.

Among the improvers of domestic live stock within the last two centuries, both in Europe and America, will be found men of the highest intellect, learning, refinement, position, and wealth, whose studies have been drawn to the development and exaltation of the qualities of their animals. I need not recount the names of distinguished Europeans, past and present, who have lent their influence and labors to that pursuit; nor to Americans, from George Washington, of Virginia, Chancellor Livingston, of New York, Henry Clay, the great Kentucky statesman, and a large number of eminent men of all professions and pursuits, aside from enterprising farmers proper, whose main business has been that of breeding and rearing improved classes of stock—names, both dead and living, all too numerous to mention. Nor has the attention of those breed-

CONIOMYCETES—USTILAGINEI.



TILLETIA caries Tul.

a.—Infected grain, nat. size. *b*.—Section of grain enlarged. *c*.—Spores x 500. *d*.—Spore x 1000. *e*.—Germinating Spore. *f*.—Secondary Conjugating Spores. *g*.—Secondary Spores. *h*.—Secondary producing Tertiary Spores. *i*.—Tertiary Spores again germinating.

In kernels of Wheat.

CONIOMYCETES—USTILAGINEI.



USTILAGO Segetum hh.

a.—Nat. size. *b.*—Infected grain enlarged. *c.*—Spores x 500.

d.—Spores germinating further magnified.

On Cereals and Grasses.

ers and improvers been limited to the most valuable classes of stock, but equally so to those of minor commercial value. Women, too, of equal rank and position in society with men, both in Europe and America, may be classed in the noble array of fine-stock improvers—all in their labors benefactors of mankind.

God has appointed our lot in a country of diversified climates, and blessed it with a wondrous fertility of soils. If a due improvement of our advantages be hereafter neglected, on those guilty of that neglect will rest the penalty; and yet, when another Centennial of American Independence shall arrive, we trust that those who then succeed us may rejoice, as we, their progenitors, now do at the present, in a still higher advancement to crown their labors with thanksgiving and gratitude to the benignant Father of Mercies for the successes they shall have achieved and enjoyed.

MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

CONIOMYCETES USTILAGINEI.—*Ustilaginei* is the name given to a family of Coniomycetes fungi related to the *Uredinei*, generally distinguished by their growing in the interior of the organ, (especially the ovaries and anthers,) of flowering plants, causing deformity, absorption of the internal tissue, and its replacement by a pulverulent substance consisting of the spores of the fungi. In the earlier stages, the infected organ exhibits either a grumous mass, or an interwoven filamentous mycelium, from which acrogenous spores arise; finally, the mycelium disappears, and a dark-colored (often fetid) powder remains, composed entirely of the spores, which are simple.

Ustilago segetum.—A genus of *Ustilaginei* frequently found on cereals and grasses, forming the blight called *smut* of corn, commonly infesting wheat, oats, barley, and other grasses, filling the ears with a black powder of smooth spores about 1.5000" in diameter, in corn sometimes about twice as large in the varieties attacking species of *Bromus*. The smut of maize, *U. maidis*, has minutely echinate spores 1.2500" in diameter. Sedges are infested by *U. olivacea* with olive-colored spores. *U. antherarum*, growing in the anthers of *Caryophyllaceæ*, has violet-colored spores. Many other species are described by Tulasne.* The cuts representing *Ustilago segetum* and *Tilletia caries* are from original drawings by M. C. Cook, and form part of my series of water-color sketches and drawings representing microscopic fungi at the Centennial Exhibition. It is proposed to publish the entire series in the reports of the Department.

FACTS FROM VARIOUS SOURCES.

BEST TIME TO SOW OATS IN THE SOUTH.—Mr. D. J. Sanders, secretary of the agricultural and mechanical association in Jackson County, Georgia, expresses the opinion that in that section 90 per cent. of the crops of oats sown in the spring, or in the autumn after Christmas, either rust or fall down before ripening, and that unseasonable sowing is the main cause of failure in the oat-crop at the South. He adds: "They should be sown in August and September, or the first week in October, in order to insure a crop."

PROSPEROUS AGRICULTURE.—The secretary of the agricultural association in Jackson County, Georgia, reports that in that county the oat-crop is better than last year by 50 per cent., corn by 100 per cent., and sorghum by 200 per cent. The sorghum-crop also surpasses that of last year in quality. Under date of September 22 he reports that tables in

* See micrographic dictionary.

the community were being supplied with delicious beans of a second crop from seed sent out by the Department last spring.

VALUE OF AUTHENTIC INFORMATION.—Our correspondent in Williamson, Texas, sent to the Department for examination a specimen of bat-excrement found in a cave near Georgetown, in that county. The results of a chemical analysis were published in our monthly report for June. As one consequence, the cave, which was bought one year ago for \$200, has recently been sold for \$1,500.

SHEEP-FARMING IN OREGON.—Mr. S. G. Reed, of Portland, Oregon, at the request of the Commissioner, has furnished some very interesting facts in regard to sheep-husbandry in that State. He has raised a flock of pure-blood Cotswolds and Leicesters, the former imported from England in 1871, and the latter from New Zealand. He has found the climatic and other conditions in Oregon very favorable to sheep-raising. The aggregate weight of five average Cotswold ewes, March 30, 1876, amounted to 1,091 pounds, or 218.2 per head; five average Leicester ewes, at the same time, aggregated 991 pounds, or 198.2 each. In 1874, the fleece of the Cotswolds averaged 14 pounds and of the Leicesters 13 pounds; in 1875, 13½ pounds and 11½ pounds; in 1876, 12½ pounds and 10½ pounds. In the spring of 1876, the Cotswold ewes produced 220 per cent. of lambs and the Leicesters 145 per cent. An acre of perennial rye-grass will carry five large Cotswold sheep through the year. The wool is excellent for combing, and commands the highest price in market.

Mr. Reed incloses an article on sheep-farming in Oregon, written by Mr. William Watson, in which the adaptation of Eastern Oregon and Eastern Washington for sheep-raising is claimed to be unsurpassed by any of the great sheep-raising countries of the world. Pasturage of native grasses is abundant and nutritious, with ample supplies of water. The atmosphere is pure and balmy. No malaria lurks in the air, and atmospheric disturbances are few and not severe. Men of small capital will find chances of profitable settlement. A section of land, 640 acres, may be purchased at \$750 to \$1,000, with some improvements. But outside of this area a vast surface of unappropriated pasturage promises abundant food for live stock. Government lands are regarded as free quarters by settlers. A shepherd should be employed for every 2,000 head or less.

A flock embracing 2,000 ewes, at \$3 per head, would cost about \$6,000 for the female breeding-animals. During the first year the loss on stock will be covered, on an average, by 5 per cent. of the investment, or \$300; the wages of a shepherd, at \$40 per month, would amount to \$480 per annum; extra help at lambing-time, \$50; board of hands, \$450 per annum; extra shearing, at 8 cents per head, \$160; wool-bags, \$100; hauling wool to market, \$100; total, \$1,640. Per contra, the first year's clip, 5 pounds per head, at 25 cents per pound, would amount to \$2,500; 1,800 lambs, at \$2 per head, \$3,600; total \$6,100, leaving a net profit of \$4,460, or 77 per cent., on the cost of the ewes. This estimate makes no allowance for scab, which no sheep-raiser should permit to infect his flock. It can be easily checked by prompt and intelligent treatment in that climate. Winter-feed will also require some outlay, in addition, but the hay-crop can be made on the spot, at comparatively little cost.

These figures refer to the class of animals common in Eastern Oregon. The breeds here are a mingling of Cotswold, Southdown, Merino, etc. An intelligent method of breeding would soon develop a fixed type, suited to the economic demands of the country. Mutton-production should be combined with wool-production. Probably a cross between the Leicester and the Merino, giving a medium-sized sheep, with a heavy fleece and good mutton, will meet the requirements

Western Oregon has the advantage over Eastern Oregon in its more abundant facilities of transportation. The eligible Government lands are here mostly appropriated by settlers. Many of them came out to the country under the strong inducements held out by the Government from 1845 to 1854, when permanent *bona-fide* settlers were endowed with 640 acres each. This policy covered Western Oregon with large farms, but there is an increasing disposition among these land-owners to dispose of their real estate. Good lands in the Willamette Valley can be had at prices ranging from \$10 to \$30 per acre.

Mr. William H. Barnhart, of Pendleton, Umatilla County, in a letter to Mr. Reed, states that in Eastern Oregon sheep, with few exceptions, are low grades of Cotswold and Merino, kept in flocks of 1,000 to 2,000. Within two or three years several hundred full-blooded Cotswold and Merino rams have been imported, a measure which cannot fail to raise the grade of sheep in this region. Indeed, a decided improvement is already noted in the average weights of fleece and in the length and fineness of the fiber. The clip of 1876, a favorable year, will probably average six pounds per head, against less than five pounds in 1875, when the flocks were in comparatively low condition. The lambing-season commences about March 25; the average per cent. of lambs that survive the inclemencies of the weather is about 70. The price of wool has averaged about 25 cents per pound for the last ten years. Mr. Barnhart's estimates of cost do not differ greatly from those of Mr. Watson. The wool-production of Eastern Oregon suffers from a very awkward and unscientific handling of immense natural resources. The greatest drawback to sheep-raising here is found in the deep snows in certain localities. Forty to sixty days' feeding is esteemed a very hard winter by farmers, who generally calculate upon an open range during almost all the year.

Mr. Watson says that the wool-product of the Umpqua, Willamette, and Rogue River Valleys is of a high quality, both of long and short staple, and commands the highest price in the Pacific and eastern markets. After many years' experience, he gives preference to long-wooled sheep in those valleys, such as the Leicester, Lincoln, and Cotswold. New Oxfords have been successfully domesticated, yielding very excellent wool. The fleeces of any one of these breeds may easily be made to average 12 to 15 pounds each, where the sheep are properly cared for. The increase may be raised to 120 per cent., or even 150 per cent. In 1874, some Leicester ewes, only one year old, averaged 15 pounds of wool, and Cotswolds from 17 to 20 pounds. For Eastern Oregon, the cross of any one of these breeds with high-grade Merino ewes presents the most desirable qualities. The weight of fleeces in Eastern Oregon averages from 4 to 7 pounds per head, and the increase of lambs may be made to reach from 70 to 120 per cent. In Eastern Oregon, upon natural grasses, about two sheep to every three acres of pasturage is the limit beyond which flocks should not be increased. In Rogue River Valley, if land were properly laid down to alfalfa, it would probably be practicable to subsist seven sheep for seven months on the product of a single acre. They should then be removed for the other five months to the rich pastures east of the Cascade Mountains. Alfalfa can be made to yield from 6 to 10 tons of hay per acre. When the crop is raised and secured, the sheep should be brought back and fed upon it, thoroughly chopped. Improvements in transportation will soon reduce the cost of marketing wool in San Francisco from 5 cents per pound to 2 cents. This will also open up a demand for mutton-sheep, yielding the farmer 8 to 12 cents per pound. The grasses of Oregon, it is claimed, are finer and more nutritious than those of California, hence at the close of win

ter the condition of Oregon sheep is uniformly better than those of California.

IRON AND STEEL PRODUCTION.—The decline in the production of iron and steel was greater in the second year of the prevailing financial depression than in the first. The only general increase in manufacture was in Bessemer-steel rails, crucible cast steel, open-hearth steel, and nails and spikes; but individual States have manufactured more largely than in 1874, viz, Maine, Virginia, Georgia, Indiana, Illinois, and Wisconsin.

The following statement of the net tons manufactured in the years indicated is made on the authority of the American Iron and Steel Association:

Kinds manufactured.	1872.	1873.	1874.	1875.
Pig-iron.....	2,854,558	2,868,278	2,689,413	2,266,581
Rolled iron, including nails and rails.....	1,941,992	1,966,445	1,839,560	1,890,379
Bessemer-steel rails.....	94,070	129,015	144,944	290,863
All other rails for railways.....	905,930	761,062	584,469	501,649
Street-rails.....	15,000	9,430	6,739	16,340
Nails and spikes.....	203,261	201,235	245,609	236,343
Crucible cast steel.....	29,260	34,786	36,328	39,401
Open-hearth steel.....	3,000	3,500	7,000	9,050
All other steel.....	7,740	13,714	6,353	12,607
Blooms from ore and pig-iron.....	58,000	62,564	61,670	49,243

The decline in rolled iron has been very small, and mainly in 1874, the product of the past year being greater than in the preceding. Pennsylvania produces nearly a third of all the rails. The sources of production of pig and rolled iron are, in detail, as follows:

States.	Pig-iron of all kinds, in net tons.				Rolled iron, in net tons.	Iron and steel rails, in net tons.
	1872.	1873.	1874.	1875.	1875.	1875.
Maine.....		780	1,661	2,046	8,100	4,050
New Hampshire.....					1,000	
Vermont.....	2,000	3,100	3,450	2,400	6,204	6,204
Massachusetts.....	17,070	21,136	27,991	21,255	99,712	18,391
Rhode Island.....					9,584	
Connecticut.....	22,700	26,977	14,518	10,880	9,618	
New York.....	291,155	296,818	326,721	266,431	181,606	82,960
New Jersey.....	103,858	102,341	90,150	64,069	55,249	941
Pennsylvania.....	1,401,497	1,389,573	1,213,133	960,884	738,830	255,136
Delaware.....					15,252	
Maryland.....	63,031	55,986	54,556	38,741	46,687	30,619
Virginia.....	21,445	26,475	29,451	29,985	18,843	
North Carolina.....	1,073	1,432	1,340		800	
Georgia.....	2,945	7,501	9,786	16,508	10,325	6,500
Alabama.....	12,512	22,283	32,863	25,108	1,000	
Texas.....	619	220	1,012			
West Virginia.....	20,796	23,056	30,134	25,277	54,299	406
Kentucky.....	67,396	69,889	61,227	48,339	33,961	5,851
Tennessee.....	42,454	43,134	48,770	28,311	13,745	12,250
Ohio.....	399,743	406,029	425,001	415,893	237,591	91,775
Indiana.....	39,221	32,486	13,732	22,061	44,073	23,309
Illinois.....	78,627	55,796	37,946	49,762	200,676	188,248
Michigan.....	100,222	123,506	136,662	114,805	3,450	
Wisconsin.....	65,036	74,148	50,792	62,139	42,840	28,403
Missouri.....	101,158	85,552	75,817	59,717	31,540	17,396
Kansas.....					5,000	5,000
California.....					14,194	8,073
Oregon.....			2,500	1,000		
Utah.....			200	150		
Wyoming.....					7,000	7,000
Total.....	2,854,558	2,868,278	2,689,413	2,266,581	1,890,379	792,512

Exclusive of abandoned stacks, the number of completed furnace-stacks in the country, at the close of 1875, was 713, but only 293 of these were in blast. In the same year 24 new stacks were completed and 4 were abandoned; in 1874, 38 new stacks and 2 abandoned; 1873, 50 new stacks and 5 abandoned.

Bessemer-steel rails were first made upon orders in this country in 1867. In 1869, the net tons manufactured were 9,650; in 1870, 34,000; 1871, 38,250; 1872, 94,070; 1873, 129,015; 1874, 144,944; 1875, 290,863; there are also 61,058 net tons of steel other than Bessemer.

The value of imports of iron and steel in 1875 was \$15,273,315, against \$24,600,720 in 1874; \$45,764,670, in 1873; and \$61,724,227, in 1872.

MATÉ OR PARAGUAY TEA.—Among the novelties presented at the Centennial Exposition at Philadelphia is the maté, a decoction of the leaves of the maté tree, (*Ilex paraguayensis*.) This tree grows wild in the forests of Brazil and the Argentine Republic, especially upon the various tributaries of the Parana and Uruguay; it is also found in the valleys of streams whose waters join the Paraguay to the northeast. The tree sometimes approaches medium-sized apple-trees in height, but the leaves are gathered mostly from smaller shrub-like plants. It is stripped of its leaves and branches almost every other year. Several varieties of this tree are mentioned, especially two; the mild or choice, and the strong.

At the exposition a pamphlet, in Portuguese, French, English, and German, written by Dr. Antonio Joaquin de Macedo Soares, presents the claims of the province of Parana, which exports mostly through the ports of Paranaguá and Antonia. The exports of the fiscal year ending June 30, 1870, amounted to 31,777,408 pounds, and rose the following year to 36,073,713 pounds. The home consumption in Parana is almost 9,000,000 pounds per annum and in Rio Grande do Sul nearly four times as much, not including large quantities consumed by natives, without having been marketed. An arroba (32.39 pounds) is estimated as sufficient for the consumption of a single individual about six months, if taken three times per day, and this would cost about \$4 per annum, whereas an equivalent of coffee or of black or green tea would cost much more.

It is claimed that the maté beverage is very nourishing. It is prepared either from the powder of dried leaves pulverized or from the leaves themselves by infusion. It needs intelligent experiment and observation to develop the real qualities of the plant, but it has become the favorite beverage of a large portion of the people of South America. It is less exciting than either tea or coffee, as it contains less of essential oil, while its larger proportion of resin makes it a better diuretic than coffee, though it is less rich in this element than either green or black tea. It has a pleasant aroma, and when taken with milk and sugar it is a good substitute for tea or coffee. It slightly stimulates the nervous system, but not to the point of sleeplessness. It contains as much theine as tea and double the quantity found in the same weight of coffee-grains. It is sold in Rio Janeiro at about ten cents per pound.

BRITISH LIVE-STOCK PRODUCTION.—The question of meat-supply is still agitating British economists. The decrease of horses and the rise in their market value constitute another source of uneasiness. An effort was recently made by the Royal Society of England to ascertain whether the problem of production in the United Kingdom did not embrace some latent conditions the development of which would secure to the British farmer a wider margin of profit in the production of horses and beef-

cattle. In the first article of the society's report for 1876 are embodied the results of an investigation, as compiled by W. McDonald, editor of the North British Agriculturist, from public documents and from original statements by intelligent and representative agriculturists in different parts of the country. The writer concludes, from the facts brought out by the investigation, that farmers would be benefited by a closer attention to live stock, especially cattle.

Live-stock breeding has for some years been more profitable than grain-raising, and present indications point to a continuance of this state of things, which is attributed in part to the superior quality of British beef and mutton, in part to the difficulty of importing foreign products that can rival them in the market, and in part to the abundant imports of excellent grain from abroad. British farmers can supply a much larger proportion of meat than twenty years ago, but the demand has kept pace with the supply.

The total number of cattle in Great Britain in 1875 was 6,012,824, against 5,337,759 in 1871 and 4,993,034 in 1867; an increase of 1,019,790, or over 24 per cent., in eight years. The aggregate of 1875 was 112,667 less than in 1874. Ireland reports 4,111,990 in 1875, an increase of 404,187, or nearly 11 per cent., in eight years. The total for the United Kingdom in 1875 was 10,124,814, against 8,731,473, an increase of nearly 16 per cent. in eight years.

Sheep-raising has not been so expansive, though it is well known that in some districts sheep have done better than cattle, in some cases replacing the latter. This is traceable to the rinderpest. In 1867, the number reported in Great Britain was 28,919,101; in 1868, 30,711,396; in 1871, the number had fallen to 27,119,569; it rose in 1874 to 30,313,941, but fell to 29,166,139 in 1875. Ireland had 4,826,015 in 1867, 4,228,721 in 1871, 4,437,613 in 1874, and 4,248,158 in 1875. In 1875, the United Kingdom had 33,414,297.

The number of horses in Great Britain fell from 1,461,061 in 1869 to 1,276,444 in 1873; but the number has since increased, though not yet equal to that of 1869; in 1875 the number was 1,340,129. In Ireland, horses rose from 527,248 in 1869 to 540,745 in 1872, but fell to 526,160 in 1875. The total of the United Kingdom for 1875 was 1,866,289.

The quantity of beef and mutton annually produced has greatly increased within thirty-five years. In 1841, but 4,500 cattle were on sale in the London Christmas market, the price ranging from 3s. 8d. to 5s. per stone of 8 pounds, averaging about 4s. per stone, or 6d. per pound, sinking the offal. At the Christmas market of 1875, 7,660 cattle were exposed to sale, at prices varying between 4s. 4d. and 6s. 6d. per stone, and averaging nearly 6s. per stone, or 9d. per pound; an increase of 50 per cent. since 1841. The advance in the lower grades has been still greater. In 1841, the choice animals were, in quality, further ahead of the general supply through the year than they are now. The June prices of cattle during the last thirty years show a greater advance than the Christmas prices: they averaged 4½d. per pound in June, 1849; 4¾d. in 1851; 6¾d. in 1855; 6d. in 1859; 6½d. in 1864; 7d. in 1868; 8d. in 1871, and 8¾d. in 1875. These are the estimated averages of prices paid to the farmer or breeder for animals on the hoof. The June prices of mutton averaged as follows: 1849, 5d. per pound; 1851, 5d.; 1855, 6¾d.; 1859, 6½d.; 1864, 6¾d.; 1868, 7½d.; 1871, 8½d.; 1875, 9d. While the cost to the consumer has been thus enhanced, the share of the producer has not increased in a similar proportion. The scope of middle-men's profits has greatly enlarged within the past few years. Even country markets now support a class of intermediate salesmen, who make quite a "nice thing" of it.

The increase in the demand for butchers' meat has been greater than the increase of population. The proportion of persons consuming animal food has increased 50 per cent. The question has been raised whether this increase has not been excessive and abnormal, greater than the healthy subsistence of the population demands. But in spite of such questions, there is more likelihood of an increase than of a falling off in the rate of consumption.

The United Kingdom, within the last three or four years, has imported an immense amount of bacon and hams, which imports alone constitute 14 per cent. of the annual meat-consumption of the British people. Excluding these two items, the live cattle, sheep, and swine, together with what are technically called "pork" and "beef," add only $6\frac{1}{2}$ per cent. to the home product. Estimating that one-fourth of the cattle of the British isles are annually slaughtered, and the average weight at 6 cwt. 1 qr., the aggregate would include 2,531,201 animals and 15,820,006 cwt. of beef. Supposing that five-twelfths of the sheep are annually brought to the knife, the total number of these animals slaughtered would be 13,922,624, which, at an average of 70 pounds per head, would yield 8,701,640 cwt. of mutton. Estimating the number of swine killed annually as equal to that of the census, and that these average 10 stone, the result will be 4,348,941 cwt. of pork. The grand total of beef, mutton, and pork, of home production, is 28,870,587 cwt., or 3,233,505,744 pounds.

Of cattle, including all grades, from calf to bulls and oxen, 263,698 were imported during 1875, almost entirely for direct consumption. Allowing $4\frac{1}{2}$ cwt. per head as their average weight, they would yield 1,186,641 cwt. of beef. Of sheep, 977,863 were imported, averaging, probably, 13 pounds per quarter, and yielding 454,007 cwt. of mutton. Finally, 71,928 live swine yielded about 1 cwt. each, making 1,712,576 cwt., or 191,808,512 pounds of fresh meat from imported animals.

The foreign imports of dead meat are given at 2,898,293 cwt. of bacon, hams, and "pork," and 216,516 cwt. of beef; total, 3,114,809 cwt., or 348,858,608 pounds. The grand total of meat-consumption, domestic and foreign, is 3,774,172,864, or 114 pounds *per capita* of the population, estimated at 33,000,000. The portion imported is thus a little less than 15 per cent. Adding the fish, poultry, and wild game annually marketed, the British people must be considered as large meat consumers.

TEN YEARS OF FRENCH AGRICULTURE.—A French agricultural journalist, reviewing the progress of farming in France during the past ten years, finds considerable progress in co-operative effort among the farmers, and a gratifying development of individual character and intelligence in certain quarters, but too much reliance is still placed upon the initiative and co-operation of the government in enterprises that properly belong to individual or associated effort. Too much of what was graphically called "official agriculture" still subsists. The reform by which this incubus is to be dispelled is more radical and tedious than many sanguine Frenchmen are disposed to believe.

Ten years ago the government of Napoleon III prosecuted an inquiry into the causes of agricultural crises, the fluctuating yields of the different crops, the steady increase of wages, rents, and taxes, and an attempt was made to devise some method of relieving these difficulties. The facts elicited pointed to the commercial treaties with foreign powers and to a defective internal administration, involving an ill-distributed and oppressive taxation, a terrific waste and misdirection of funds in

internal improvements, an excessive accumulation of warlike armament, an undue tendency of capital and labor to great cities, luxurious habits of the citizens, and neglect of the means of influencing the action of government. These clear indications were adroitly evaded by the imperial commissioners, who admitted the justice of the complaints made by the agricultural interest, but criticised the proposed methods of relief. The foreign policy of the country could not be disturbed; great military and naval armaments, and a large expenditure in internal improvements were imperatively demanded to maintain the prestige of the empire. Hence the taxes must be kept up and the farmers must "grin and bear it." Yet, in spite of the restrictions and oppressions of misgovernment, French agriculture has during the past decade made very encouraging progress.

The industrial system of the north is pivoted upon the sugar-beet. Here high culture has ever led in the march of improvement. The splendid productive power of this region has attracted the attention of this government as a large tax-paying region. In fact, the policy of some administrations has emulated the wisdom of the man in the fable who killed the goose that laid the golden eggs. It had passed into an official parable that each hectare of this region would bear an average tax assessment of about 2,000 francs, or at the rate of \$160 per acre. Some sapient political economists in official circles insisted that the government should attack the best resources and get money wherever they could get it most easily, but a strong protest was heard in quarters more entitled to respect, urging the impolicy of crippling resources in process of development. It was urged that the most profitable element in the sugar-beet industry to the country at large is not the manufacture of sugar and alcohol, which yield so large a basis of taxation, but in the immense amount of fertilizing matter which the beet yields as stock-feed, enabling the farmers of this region, with their heavy taxes, high values of real estate, and high wages of labor, to compete with the cheap products of vast unfertilized regions abroad, in which what is called culture is but a spoliation of surface fertility. The policy of the state in the treatment of this region has been one of craft. While ostentatiously distributing a few millions of francs with one hand, in agricultural prizes, with the other it has been stealthily and noiselessly depleting the system of its strength by taxes bearing directly upon its most vital points. French farmers are so accustomed to routine and so unused to look beyond their own immediate horizon, that these abuses have passed unchallenged, and the grievances uttered by a few of the more intelligent, not being supported by the general voice, have failed to awaken official attention to these oppressions. Meanwhile intelligent farmers appealed to science, and sought those methods of culture which would enrich the product and give a wider margin of profit with which to meet the grasping power of taxation. By persistent energy, and in spite of adverse circumstances, the sugar interest has made great advancement within the past ten years.

Southward is a region of far different character, in which the *intensive* culture of the north, after ample experiment, has been abandoned and what is called *extensive* culture has been adopted. The maize-plant is the key of this system, as the sugar-beet is in the north. Fossil superphosphate of lime furnishes a stimulating fertilizer, and immense masses of forage-plants give rise to extensive stock-feeding and large accumulations of barn-yard manure.

Still further southward is the region of the vine, the olive, and the mulberry. Here rocky, dry, thin soils, unsusceptible of high culture, have

been utilized and an immense production has been realized, though the dreaded *phylloxera* has threatened destruction in several departments. The tax-gatherer has an intimate connection with this region, while the wine interest has been the scare-crow of foreign-tariff regulators. Other wine-making countries have surplus products to export, and any unfriendly legislation may be expected to react in the shape of reprisals upon French exports. The cautious foreign policy of France has measurably avoided the alternate perils of excessive foreign competition at home and of closed markets abroad. The collision of interest once supposed to exist between the vine and sugar-beet regions has been obviated. It is found cheaper to re-enforce the weak wines of the south with alcohol from the beet than to distil it from grapes. Sericulture, an important interest of this region, has suffered from the malady of silk-worm eggs, requiring a renewal of the stock from oriental countries. But, in spite of causes which have threatened the stability of these southern industries, substantial progress is believed to have been secured. Scientific culture has narrowed the range of disastrous influences, and the southward extension of some northern crops has diversified the culture of this region, giving greater stability and more certain returns.

A large number of French farmers command but narrow resources, realize limited returns, and are under pressure to sell as soon as possible after harvest. This is the farming of the moors, of recent forest-clearings, and of natural pastures. Popular delusions as to the practicability of redeeming these poor lands from their comparative sterility have been generated and stimulated by corrupt artifices, and an important function of agricultural journalism has been to puncture these bubbles and explode these delusions, which have entailed great losses upon parties but little able to bear them. But the increased activities of commerce and other changes of circumstances have largely tended to redeem this class of lands from the class of unprofitable culture, and to utilize what would otherwise be a waste.

The questions of share-farming and rent-farming have approximated a settlement, and the profitable circumstances and limits of each are becoming much better understood than formerly. Great soil-improvements, with facilities for irrigation, have placed many previously-uncultivated soils in the list of profitable culture. The cultivation of these soils by their actual proprietors has removed one of the difficulties that embarrassed a large class of cases. The extension of the methods of economic science to lands of inferior fertility has also broadened the area of cultivation. The relations of supply and demand are better understood than they were ten years ago, and hence agricultural enterprise has been directed to far more profitable results. The writer of this *résumé* sums up the great benefit of the past decade in the close approximation of men of science, of men of labor, and of men charged with governing society, and the more complete harmony resulting from a more thorough interchange of views. The causes of friction are in process of removal, and the productive resources of France have consequently received a higher development.

AGRICULTURAL WAGES IN FRANCE.—M. De Foville, in the *Economiste Français*, gives a review of the changes in the wages of farm-labor in France during the past half century. The facts indicate a great improvement in the conditions of rural laboring-life. Fifty years ago great destitution, and occasional starvation, were the salient features of the condition of the rural working classes. A great amelioration has been wrought during the last half century, and those revolting extremes of suffering are no longer heard of.

In 1788, the annual income of a family of farm-laborers, by day's work, amounted to about 200 francs, which was about 20 francs greater than in 1700, under the closing days of the splendid but destructive reign of Louis XIV. Twenty-five years later, during which the old monarchy, gangrened with corruption, had been broken up by the cataclysm of the revolution and replaced by the empire, the wages of farm-labor had doubled in most of the departments. At the restoration of the Bourbons, in the person of Louis XVIII, Chaptal estimates the average recompense of a laborer at 1.25 francs per day, or 375 francs for a year of 300 working days; the income of a female laborer was estimated at 120 francs, or 60 centimes per day, for 200 working days. M. Moreau de Jonnès thinks that, in 1813, families, as a whole, averaged about 400 working days in the year, counting the engagements of different members, which would give an aggregate wage at least double what it was during the reign of Louis XIV.

M. De Foville attributes these beneficent changes to the social reforms of the revolution, which bore fruit in spite of the frantic excesses of the anarchical *régime* of the convention and of the bloody wars of the empire. The last remnant of feudalism was eliminated from social order. The peasant was emancipated and placed before the law upon a footing of entire equality with those who were lately his masters and *seigneurs*. He could choose his own field of labor and stipulate his own wages, which were no longer fixed by arbitrary enactment. The public sale of national and confiscated real estate gave a great impetus to the development of small proprietorships, a change which had begun under the old monarchical *régime*. The peasant was not only liberated, but enfranchised, and the means placed within his reach of acquiring an ownership in the soil. Whatever may be thought of the justice of the wholesale confiscations ordered by the revolutionary government, it is beyond doubt that these measures resulted in the elevation of the laboring classes, not only those who became land-owners, but also day-laborers.

The next twenty-five years, from 1813 to 1838, were a period of comparative peace and prosperity. Prices remained comparatively stationary to its close, but the development of manufacturing enterprise had lowered the price of its products. Meanwhile the advance of agricultural wages continued, yet about the beginning of the reign of Louis Philippe the price of day's work began to oscillate from 0.75 francs to 1.75 francs. M. Charles Dupin estimates the average income of a laboring family at 475 francs per annum, ranging from 508 francs in 33 departments of the north and west to 441 francs, the average of all the others. In 1840, according to M. Moreau de Jonnès, the average had risen to 500 francs per annum. Since the middle of the present century the French government has prosecuted several *enquêtes agricoles*, prominent among which are those of 1852 and 1862. These inquiries are accepted by M. De Foville as embracing a large proportion of truth after their errors have been eliminated by a critical scrutiny and by comparison with cantonal statistics. The differences between the results of this scrutiny and those of the *enquêtes* is trifling, showing a substantial agreement in two independent lines of inquiry. In 1852 a day's wages averaged 1.42 francs; in 1854, 1.54 francs; in 1855, 1.61 francs, showing an enhancement of 13 per cent. from 1849 to 1853. In 1862 the day's wage averaged 1.85 francs, an increase of 30 per cent. in ten or twelve years.

In the twenty departments paying the highest prices for farm-labor the daily wages in 1849 ranged from 1.47 francs in Lot-et-Garonne to 2.04 francs in Vaucluse. In 1855 the range was from 1.76 francs in Hérault to

2.38 francs in the department of the Seine. In 1862 the range was from 2.12 francs in Hérault to 3.10 francs in the Seine. The latter shows the highest rate of increase from 1849 to 1862, viz, 55 per cent. The smallest increase, 7.84 per cent., is found in Vaucluse. But these are the most progressive agricultural regions of France. From 1849 to 1853 day's labor in Côtes-du-Nord was paid only 0.8 francs per day, and in 1862 had increased to only 1.14 francs, or at the rate of $42\frac{1}{2}$ per cent. In the remaining departments the increase was between 17 and 44 per cent., but in all the wages were very low. The average increase was about 33 per cent. In 1852 women were paid on an average 0.89 francs per day, without board, or 0.47 francs with board. In 1862 the daily wage had risen to 1.14 francs without board and 0.62 francs with board, the former having increased 28 per cent. and the latter 32 per cent. Children, without board, received 0.61 francs per day in 1852 and 0.82 francs in 1862, an increase of $34\frac{1}{2}$ per cent.; with board they received 0.31 francs in 1852 and 0.43 francs in 1862, an increase of $38\frac{3}{4}$ per cent. in ten years. These figures take no account of the exceptional increase of wages at harvest and vintage. During these special periods of the year men in 1862 received 2.77 francs per day without board or 1.82 francs with board; women, 1.73 francs without board and 1.13 with board; children, 1.22 francs without board and 0.77 with board.

The average number of days' labor per annum in 1862, for men in the eight departments giving the largest amount of employment, for men ranged from 265 days in Pas-de-Calais, to 275 in Seine; for women, from 192 in Pas-de-Calais, to 249 in Var; for children, from 140 in Pas-de-Calais, to 193 in Var. In the eight departments in which rural employment was least active, especially among the mountains, the average number of days for men varied from 156 in Savoy, to 183 in Meuse; for women, from 118 in Savoy, to 152 in Haute-Saône; for children, from 81 in Savoy, to 120 in Ariège. The average for the whole country was 226 days per annum for men, 172 for women, and 129 for children. A family in which the father, mother, and one child obtained the average number of days' labor received 550 francs per annum in 1852, and 720 francs in 1862. Besides this, a good number found extra employment in special industries. In 1700, a laborer received but 0.5 franc per day, and his family averaged 180 francs per annum; in 1788, 0.6 franc per day, and 200 francs per annum; in 1813, 1.05, and 400; in 1840, 1.30, and 500; in 1852, 1.42, and 550; in 1862, 1.85, and 720; in 1872, 2, and 800. Thus, the daily wage of a man doubled in the 25 years from 1788 to 1813, and quadrupled in the 84 years from 1788 to 1872.

But in order to test the point whether this advance of wages represents a real improvement in condition, the writer makes a calculation in regard to the expense of living and the quality of its elements. Averaging families at five persons each, and allowing each person 3 hectoliters, or $8\frac{1}{2}$ bushels of wheat per annum, the quantity consumed by each family will average 15 hectoliters, or $42\frac{1}{2}$ bushels per annum. In 1700, when the annual family income was 180 francs, the hectoliter was worth 18.85 francs, and the quantity above assigned for family consumption cost 283 francs per annum, or 103 francs more than the family income. In 1788, the annual family income had risen to 200 francs, and the average price of wheat had fallen to 16 francs per hectoliter, yet the cost of the 15 hectoliters was 240 francs, or 40 francs more than the family income. During the next twenty-five years, ending in 1813, the average family income had doubled, but the price of wheat had also risen to 21 francs per hectoliter, making 315 francs for 15 hectoliters, or 85 francs less than the family income. In 1840, the income had increased 25 per

cent., being 500 francs per annum, the cost of wheat had fallen a little, being 20.32 francs per hectoliter and 305 francs for 15 hectoliters, leaving a surplus of 195 francs of the income. In 1852, the income, 550 francs, had advanced 10 per cent., and the price of wheat had fallen to 19.45 francs per hectoliter, or 292 francs for 15 hectoliters, leaving a surplus of 258 francs. In 1862, the income was 720 francs, and the wheat, at 21.08 francs per hectoliter, amounted to 316 francs, leaving a surplus of 404 francs. Finally, in 1872, the income, 800 francs, after deducting 356 francs for 15 hectoliters, at 23.74 francs each, left a surplus of 444 francs. In 1700, the laboring family could pay only 63 per cent. of the cost of the amount of wheat necessary to their support, to say nothing of other and pressing necessities of their being. In 1788, they could pay 83 per cent. of the bread ration; in 1813, they could pay the whole, with a surplus of 27 per cent.; in 1840, the surplus was 64 per cent.; in 1852, 88 per cent.; in 1862, 127 per cent.; in 1872, 125 per cent.

But bread, the most essential of family provisions, has not enhanced in price as rapidly as other necessities of life. The progress of agriculture and the development of international commerce by means of improved methods of transportation, have made the price of grain more uniform. Closer relations subsist between supply and demand. The scarcity of one section is relieved by the surplus of other sections made available by easy communication. But the prices of meats, vegetables, drinks, rents, &c., have followed a higher ratio of progression; clothing, furniture, &c., however, became considerably cheaper as the century advanced. M. De Foville calculates the actual expenses of living for a working family, at three different periods in the time under consideration, as follows:

Articles.	1785 to 1790.	1810 to 1815.	1870 to 1875.
	<i>Francs.</i>	<i>Francs.</i>	<i>Francs.</i>
Food	350	400	630
Rent and taxes	25	40	60
Fire and light	20	25	30
Clothing	150	140	80
Incidentals	30	45	50
Total	575	650	850

To procure the amount of comfortable subsistence which now constitutes the rule among French villages to-day, the family of the working-man of the first empire needed 650 francs per annum, and received only 400; under Louis XVI, they needed 575 francs per annum, and received only 200, or a little over a third. The grandfathers of the French peasantry of to-day had but two-thirds, and their great grandfathers but one-third of their allowance.

The above facts indicate an unmistakable and substantial improvement in the condition of French working-men, yet it would be illogical to conclude that all suffering has been removed. But extreme poverty, M. De Foville thinks, is mostly the result of individual imprudence, rather than of necessity or external circumstances. A comparison of English and American statistics shows that the margin between wages and necessary cost of living has widened more rapidly in France than in either England or the United States. In Asia Minor, people are to-day compelled to live as slenderly as French working families did one hundred and fifty years ago. In Russia, day labor commands wages ap-

proaching to what is usual in France, but intemperance and superstition there largely detract from the amount essential to a comfortable subsistence. Germany presents a great variety of conditions. In some parts of Silesia, labor commands but 0.85 franc per day in summer and 0.7 in winter, while in the Rhine provinces it runs up to 5 francs, or \$1 per day. In England, farm-laborers have struck for wages above 1 shilling per day. The condition of farm-laborers, M. De Foville contends, is incontestably superior to that of any other country in Europe. He thinks the high prices of living in America counterbalance the high wages of labor in different parts of the country. In the United States, he thinks, women have far less facilities for gaining a subsistence than in France. In the latter conclusion, however, the writer seems to have generalized too hastily and from imperfect data.

DEPRESSION OF FRENCH SUGAR-PRODUCTION.—The general councils of two departments of France, Aisne and Pas-de-Calais, have formulated very weighty complaints against the present status of legislation affecting the beet-sugar production. From the unanimous protest of Pas-de-Calais it appears that this great interest is passing through a crisis of increasing gravity, in which a variety of agricultural and manufacturing industries are more or less compromised. The results already developing involve the ruin of a large number of sugar-factories, great losses to agriculturists from the cessation of demand for sugar-beets to manufacture, the progressive decline in the value of lands devoted to this branch of culture, a notable stagnation in several minor mechanical industries, great suffering among the agricultural working classes, and a general impoverishment of the sugar-producing population. The causes of these evils are said to be the heavier imposts levied upon this industry than in foreign countries, and the undefined character of the legislation by which those imposts have been enacted; within two years the tariff has been thrice revised, and that these revisions have but complicated the uncertainty and increased the burden upon production. The remedy proposed is another revision, more intelligent, directed to the reduction of the burdens upon this important industry.

PROPOSED PURCHASE OF AGRICULTURAL MACHINES BY FRENCH COMMUNES.—M. Teisserenc de Bort, French minister of agriculture and commerce, has issued a circular to the departmental prefects, calling attention to the advantages that may accrue to agriculture from the purchase by the communes or townships of France of the higher and more expensive agricultural machinery. French farmers in some sections are too poor and too little impressed with the advantages of superior culture to conceive or execute the idea of combining their small capital for the purchase of machinery. The minister calls upon the prefects to study the question in its various aspects, and to submit to the central government the results of their cogitations upon this subject.

ITALIAN AGRICULTURE.—A report of Mr. Miraglia, chief of the division of agriculture of the Italian ministry of agriculture, industry, and commerce, presents a *résumé* of the elementary schools of agriculture, of which not fewer than sixty-five were opened during 1875. This educational movement extends to all parts of the peninsula. There are normal schools at Palermo, Messina, Caserta, Bari, Arcoli, Picino, Potenza, Acqui, Perouse, Pisa, Reggio d'Emilia, and Pignerol, besides special schools, the number of which is on the increase. Conferences among agriculturists have also become frequent, six hundred and one being held during 1875, in sixty-five communes, with an attendance of 2,500 persons. The subjects of discussion were olive culture, sylviculture, the

maladies of garden-plants, fertilizers, rotation of crops, irrigation, cattle and sheep husbandry, &c. At the Bacologia station of Padua long conferences were held in regard to silk-worms. Farriery was treated at the station depots of Catana, Crema, Ferrara, Pisa, Ozieri, Reggio d'Emilia, Milan, and Naples. Crowded conferences in regard to viticulture and wine-making were held at Monteleone, Cantazaro, Nicastro, Cotrona, Rogliana, Cosenza, Castrovillari, and Acri. Facts were presented at these conferences showing that with a proper direction of effort Italian wines might be made to excel the best Spanish and Portuguese wines.

The entomological station of Florence shows the studies of the Cryptogamic Laboratory of Pavia in regard to the maladies engendered in plants by cryptogams and parasites. The agricultural laboratories of Bologna and Sienna have given their powerful aid to these and similar investigations—numerous analyses of soils, fertilizers, wines, waters, potable or irrigating, forage plants, farinaceous products, and alimentary substances generally. Of silk-worms 822 specimens were examined, besides 193 couples of butterflies. Agricultural expositions have been numerous and enthusiastic. At Ferrara 600 exhibitors took part; at Florence 351; at Portici 489; at Palermo 1,589.

Regional conferences have been supplemented by local exhibitions, under the auspices of communal commissioners, and restricted to special objects, such as the construction of machinery, agricultural implements, planting of vine-stocks, stock-raising, oil-making, raising of water from wells, movable cabins of Alpine pastures, &c.

The work of replanting forests has not been slackened. The ignorant vandalism which caused the destruction of the original woods has given place to a zeal for their preservation and renewal. This new-born sentiment, however, is more active in some provinces than in others. During 1875 the administration gave formal consent to the clearing of nearly 50,000 acres of woodland, of which about 28,000 acres were in the southern provinces, on the Adriatic slope of the Apennines, 5,400 on the Mediterranean slope of the same, 1,600 in Piedmont, 1,300 in the Marches and Umbria, 7,600 in Sicily, and 1,350 in Sardinia. Some of these clearings are but temporary, looking to the replacement of worthless woods by those of greater value, such as the gigantic eucalyptus, the pine, the the fir, the cedar, &c.

Italy stands in the front rank of wine-producing countries. The International Ampelographic Commission, which sat at Colmar, in September, 1875, after a careful examination, gave expression to the liveliest appreciation of the viticultural resources of the peninsula. An admirable local and national organization of the viticultural interest had brought the whole subject fairly before the commission. In this great branch of national enterprise citizens co-operate with exemplary zeal with the government authorities to bring out the most remunerating results. This is attested by the growing export of Italian wines, which now reach all foreign markets, whereas formerly they seldom found a demand except in France. The character of these wines is constantly improving. The former bad habit of producers, of multiplying their brands, is disappearing, and the time formerly lost in imitating foreign brands is better employed in perfecting their own products. This is indeed a notable improvement, and marks the transition from the period in which Italian agriculture ignored its real forces and that in which it became conscious of its independent powers.

Oil and grain culture have also advanced in productiveness and value. The latest acreage and product of these cultures are given as follows: Wheat, 11,556,062 acres, producing 146,970,713 bushels, or 12.72 bushels

per acre; maize, 4,192,253 acres, producing 88,251,466 bushels, or 21.05 bushels per acre; rice, 574,948 acres, producing 27,862,168 bushels, or 48.46 bushels per acre; oats, 985,057 acres, producing 21,123,502 bushels, or 21.44 bushels per acre; rye and barley, 1,148,517 acres, producing 19,005,698 bushels, or 16.5 bushels per acre; other cereals, 1,516,034 acres, producing 15,871,754 bushels, or 10.47 bushels per acre; grapes, 4,619,226 acres, producing 77,008,600 bushels, or 16.67 bushels per acre; olives, 2,224,759 acres, producing 14,189,100 bushels, or 6.3 bushels per acre. The product of potatoes amounts to 7,049,879 quintals; hemp, 959,177 quintals; flax, 234,057 quintals.

These statistics are gathered according to a regular system, embracing all the leading agricultural facts of the country. This report is the inauguration of a regular system of reports embracing all the elements of production, and all the data attainable from the study of the agricultural resources of Italy. Pastoral industry will hold an important place in these publications.

In spite of apparently favorable conditions pastoral industry has not been remarkably productive. This fact has been a subject of anxious consideration, both by the ministry of agriculture and the regional and other conferences. Efforts are being made, under authority of the government, for the improvement of horses, cattle, and sheep. In 1875, the government had at its disposal but 277 stallions, which served 9,711 mares, averaging about 35 each. Asses and mules seem to retrograde, while cattle present an appreciable and steady amelioration. The latter result is attributed to greater care in breeding and to more generous feeding and treatment. Last year the minister of agriculture imported from Holland five horned cattle, of which four were pregnant, and placed them in the experimental zootechnic establishment at Reggio d'Emilia, to breed with English cattle. The points of improvement sought pertain to qualities enhancing the flesh and milk-product.

Sheep and swine have also received very perceptible improvement. The errors of the previous administration, as well as its successful attempts, have been carefully studied, and practical lessons therefrom fully appropriated.

Domestic silk-worm production seems to be increasing from the fact that in 1875 the producers purchased from abroad 199,000 fewer cartons than in 1874. There are 39 special observatories of silk-worms in the country, at the head of which is that of Padua. These institutions, by the results of their investigations, have largely contributed to the advance in sericulture that has taken place within a few years past. Apiculture has also made perceptible advances.

The division of old feudal properties into modern freeholds marks an important transition in Italian agriculture. In the southern provinces alone 1,117,313 acres of feudal lands have passed into the hands of 223,398 peasant proprietors, in tracts averaging less than five acres each. This social revolution is accompanied by works of irrigation and general improvement on the grandest scale. The result of the increased power of production just called forth will make itself felt in the immediate future.

VITICULTURAL STATISTICS OF HUNGARY.—Mr. Charles Keléti, chief of the Royal Hungarian Bureau of Statistics, has published a *résumé* of the late statistical inquiries into the status of the vine-growing and wine-making interests in Hungary. He claims that the statistical method of Hungary is superior to that of other European states in the extent and thoroughness of the inquisition and the clearer and less antiquated

methods of co-ordinating the facts evolved into general principles. The statistician verified the results of his inquiries by personally visiting districts which showed any remarkable anomalies and opened an extensive correspondence with land proprietors and viticulturists in all parts of the kingdom. M. Keléti experienced some of the difficulties which have embarrassed the operations of the American Department of Agriculture, with the additional difficulty of having to collect his statistics largely through regular government officials. The tendency of cultivators to depreciate as much as possible the extent and value of their industry in the presence of those who might detail the information to the tax-gatherer showed itself in all parts of the country. The lack of statistical ideas and habits in official inquirers, who can only move in an established routine, was another source of embarrassment. Our American system of selecting boards of volunteer correspondents among the most intelligent agriculturists of the country, and of furnishing them blank forms and specific instructions, does not appear to have been suggested as a practical method in Hungary.

M. Keléti was astonished at the wide divergence between the results of his inquiries and the current estimates of grape and wine production in Hungary. Some unknown authority had stated the average annual wine-product of Austro-Hungary at 42,000,000 hectoliters, (1,109,547,600 gallons,) of which 22,000,000 hectoliters (581,191,600 gallons) were assigned to Hungary. The approximate average annual product of the Hungarian monarchy indicated by M. Keléti's inquiries is not over 5,000,000 hectolitres, (132,089,000 gallons.) This remarkable discrepancy has led him to discredit the reports of enormous wine production in other European countries in which no sifting statistical methods similar to his own had been adopted.

The kingdom of Hungary, including its vassal states of Transylvania, Fiume, Croatia, Slavonia, and the military frontier, cultivates about 1,050,995 acres in vines, or about 10 per cent. more than was indicated by an official census taken some years ago. The increase was in Hungary proper, Croatia, and Slavonia; the other sections indicate a decrease. Hungary proper embraces 80 per cent. of the viticultural area of the monarchy, while its territory is less than 70 per cent.; only 11 of the 47 vine regions indicate a declining acreage. In 5,845 communes of the whole monarchy there were 912,633 proprietors, averaging 1.20 acres; of these 4,062 communes, in Hungary proper, embraced 688,336 proprietors, averaging 1.15 acres.

Jean Hunfalvy, in his valuable "Topographical and Physical Description of Hungary," distinguishes four well-defined viniferous regions: (1) the region of the Alps and Carpathians; (2) isolated hills and mountains; (3) the low country, (Alföld;) (4) the shores of the Adriatic and the mountainous parts of Croatia and Dalmatia. The northwestern Carpathian region, at an altitude varying from 600 to 1,050 feet above sea-level, cultivates the wine only in the valleys or on southern slopes. The whole Carpathian region, from east to west, is of minor importance in vine-growing except a trachytic off-shoot to the south, extending from Eperjes to Tokay, on the Theiss River. The city last named is the market of a celebrated aristocratic beverage called by its name and produced in a hilly region to the northward called Hegyallia, embracing about ninety square miles. With this exception, the production of wines, and especially of generous wines, in the Carpathian region is confined to isolated hills and mountains. The low country (Alföld) produces an abundance of common, cheap wines for local consumption. Vine-growing is prosecuted to a great extent in Fiume, and a narrow zone of vineyards fronting the Adriatic extends

through the "regiments" Ogulini, Ottocsány, and Likka of the military frontier.

In Hungary proper 25 viticultural regions are enumerated, arranged along the Danube and Theiss Rivers; 6 in Transylvania, and 6 in Croatia, Slavonia, Fiume, and the military frontier. These regions range from 75 to 1,800 feet above sea-level, presenting a great variety of geographical conformation and of local character. The prevailing characters of the surface-soil are classified as follows: vegetable mold, 14.2 per cent.; clayey, 41.3 per cent.; sandy, 29 per cent.; gravelly, 13.7 per cent.; calcareous, 0.2 per cent.; nitrous, 0.2 per cent.; miscellaneous, 1.4 per cent. The climate presents wide variations of temperature, with a very unequally distributed rain-fall. Early frosts and long droughts are also complained of.

Varieties of grapes grown are not always such as suit the soil, climate, and situation in which they are planted. There is now a tendency to reduce the number of varieties to those which indicate the highest results. This will simplify the processes of culture and give uniformity to the products. Both the white and the red wine regions are affected more or less by a confusion resulting from the intermingling of species and of vines of different stages of maturity. Early-ripening varieties, such as the Malvoises, with a southern exposure, in dry seasons return but moderate yields, while in more northern regions, with a northern exposure, the same vines in the same seasons yield more plentifully. The same has been noted in regard to other aromatic varieties, such as the Riesling, Greensweet, Bakator, Zöldsylvany, Hermitage, Little White, &c. The grapes of Smolyó, growing upon the eastern and northern declivities of the mountains of Smolyó, are more aromatic than those grown on the southern and western slopes. The Riesling gathers more aroma in the cooler regions of Transylvania than on the warm southern slopes of Hungary. High temperature develops sugar and alcohol at the expense of bouquet.

In Hungary proper, Croatia, Slavonia and the military frontier the most common method of culture is by short cuttings, without props. In Transylvania 60 per cent. of the vines are raised upon circles. Long cuttings, raised on props, are very common in all parts of the monarchy. Each vinicultural region has its own peculiarities of treating the crop under different circumstances. The vicinity of Presburg is mentioned as practicing a very careful and scientific method.

As a premature vintage is injurious to the quality of grapes, efforts are made to secure uniformity in the time of gathering. The time is fixed by vote of the communal council in many vinicultural districts. In many cases it is deferred as long as possible, from the consideration that the shrinkage in quantity from full or over ripening is amply compensated by the superior quality of the wine. The sorting, separating, and fermentation of the grapes are regulated by reference to the prospective saccharine strength of the must. It is found that not over 25 per cent. of the sugar is converted into alcohol. An excess of sugar giving a larger residuum after conversion, renders the wine unusually sweet. This fact, it is said, renders it possible to recall good wine years by tasting their products. In such years, mature grapes are abundant. Hence it is that intelligent viticulturists will not commence gathering until their must indicates 25 per cent. or more of sugar, which occurs almost every year with good vine-stocks well cultivated and in favorable situations. In most of the districts the vintage takes place in October, but earlier or later in the month for different varieties and different locations. In the Hegyalja district, north of Tokay, late gathering is the rule, from the

last of October even to the middle of November. The leading object here is to make sweet wines. The mature grapes are either pulled off the vines singly or they are selected from the bunches spread out on a table or board. This wine is very sweet and aromatic, but is deficient in alcohol. The famous Szamorodni, the product of grapes from which the mature fruit has not been culled out, is less sweet, but more heady, with a delicious bouquet. The vineyards of the agricultural society of Kolozsvár show the following results: Transylvanian vine-stocks produce must ranging from 17 to 22 per cent. of sugar and from 6 to 10 per cent. of acid; Hungarian, from 18 to 21.4 per cent. of sugar and from 6 to 10.9 per cent. of acid; German, from 19 to 21.5 per cent. of sugar and from 5 to 8.6 per cent. of acid; French, from 18.1 to 21.7 per cent. of sugar and from 5 to 8.5 per cent. of acid. Transylvanian vine-stocks average 20.20 per cent. of sugar and 7.8 per cent. of acid; Hungarian, 19.91 per cent. of sugar and 7.97 per cent. of acid; German, 20.07 per cent. of sugar and 6.9 per cent. of acid; French, 20.64 per cent. of sugar and 6.4 per cent. of acid.

In Hungary there are 173,212 wine-presses; 29,252 on the left bank of the Danube average 697 gallons of wine per annum; 120,057 on the right bank of the Danube, 247 gallons; 9,709 on the right bank of the Theiss, 875 gallons; 14,194 on the left bank of the Theiss, 1,466 gallons. In Transylvania 19,963 presses average 504 gallons. In Fiume but one press is reported. In Croatia and Slavonia 36,007 presses average 450 gallons, and in the military frontier 2,973 presses average about 1,350 gallons.

According to official statistics, the average annual wine-product of the Hungarian monarchy, for twelve years ending with 1872, was about 3,996,576 hectoliters, or 105,580,744 gallons, of which 61,679,037 gallons were white wines, 17,684,815 gallons red wines, and the remainder, 26,216,879 gallons, rosy or light red wines. Of the general aggregate, Hungary proper produces over three-fourths, Croatia and Slavonia about 16 per cent., Transylvania about 5 per cent., and nearly all the remainder in the provinces designated as the military frontier. Nearly half of the whole product is reported in those *comitats* of Hungary proper which lie in the valley of the Danube.

The conditions of wine production in the Hungarian monarchy are so varied that it is difficult absolutely to designate the best wine year of the twelve ending with 1872. The year 1868 presents the largest yield, 140,325,682 gallons, and 1866 the smallest, 52,943,913 gallons. The year 1868 was the best year in the Hungarian *comitats* on the right bank of the Danube and on both banks of the Theiss; 1867, in Croatia, Esclavonia and Fiume; 1862, in Transylvania; 1870, in the military frontier, and 1871, on the right bank of the Danube. For white wines, throughout the monarchy the best and worst years were 1868 and 1864; for red wines, 1868 and 1866; for rosy wines, 1867 and 1866.

The sweet wines demand special notice. Of these the average product of twelve years ending in 1872 is stated by official figures at 283,371 gallons, of which 99 per cent. were produced in Hungary proper. This branch of production, however, is very fluctuating, ranging from 84,600 gallons in 1871 to 681,750 gallons in 1868. That is, the maximum production is nearly nine times the minimum and nearly three times the average. Only twenty-one *comitats* of the fifty-four in Hungary proper, eight of twenty-six in Transylvania, three of eight in Croatia and Slavonia, and one regiment of the military frontier, Petervarad, produce this class of wine. The *comitats* producing the greatest quantities are all in Hungary. Zemplén sometimes produces from 260,000

to 390,000; Borsod and Abaúj, from 230,000 to 260,000; Bacs, 200,000 to 225,000; Bereg, 78,000, &c.

M. Keléti uses the foregoing figures of product as the closest approximation attainable, but he expresses in more than one place his lack of entire confidence in them, especially in regard to the common wines.

The wines of Hungary are classed also as sweet wines, strong or generous wines, aromatic wines, (*vins a bouquet*), and acidulated wines. In the first class the half-dried condition of the grapes augments the quantity of sugar, while the low temperature of the cellars retards the process of alcoholization to such an extent that the wines might be aptly designated as grape sirups. This class of wines is more suited to delicate tasting than to drinking. Hence, they are the favorites of the ladies, for which reason they are sometimes called "bounnet wines." Hungary proper produces by far the best of these, especially the queenly Tokay. The wines of Rust and St. George have also excellent reputation, but the conditions of growth, kinds of fruit, and methods of preparation of the Tokay give it the pre-eminence. The strong or alcoholic wines are largely exported to countries of cold or humid climates; the larger proportion of the white wines of Hungary proper belong to this class. The dry grapes are used only to a small extent in these wines. About half the sugar in the must is converted into alcohol. The aromatic wines take their character from their peculiar bouquet, alcohol and sugar being secondary elements. The grapes from which they are extracted do not require high temperature, for excessive sunshine dissipates their aromatic qualities. Hence, positions less exposed to the sun are chosen for these grapes. Of these wines the Riesling, Green Sweet, Bakator, Szerémi Zold, Green Grape of Syrmie, Hermitage, White Muscat, Vörös Diuka, &c., are the leading varieties. The acidulated wines are those produced from grapes not well ripened, and are used either for consumption by the poorer classes, or to adulterate the other classes of wines. Some of these have very desirable qualities, but these mostly bear names without synonyms in other languages than the Hungarian.

The average price of wines paid to producers during the twelve years ending with 1872, for the whole monarchy, was 20.68 cents per gallon, being 19.31 cents in Hungary, 22.16 in Croatia and Slavonia, 18.39 cents in Transylvania, and 22.9 in the military frontier provinces.

During the twelve years aforesaid the average expense of wine production was \$14.94 per acre, or \$12.54 for cultivation and \$2.40 for vintage. But there is a wide range of difference between the different provinces. The *comitats* of the left bank of the Theiss average but \$10.88 per acre; Croatia and Slavonia reach \$19 per acre. The average total value of the product is officially stated at \$21,361,000, of which \$15,828,000 represent the product of Hungary proper, \$1,095,000 that of Transylvania, \$3,625,000 that of Croatia and Slavonia, \$776,000 that of the military frontier, and \$17,000 that of Fiume. M. Keléti considers these figures as entirely too low. Taking the number of acres and the average prices indicated by the most reliable statistics, he raises the annual average to \$56,951,800, the maximum being \$98,623,650 and the minimum \$22,822,800.

M. Keléti estimates the number of wine consumers in the monarchy at 2,815,000, or about 18 per cent. of the population, who are supposed to absorb 189,388,208 gallons per annum, or 67½ gallons per capita. But this exceeds the maximum annual yield of 140,325,682 gallons in 1868; still more the average product, 108,580,785 gallons. Hungary, then,

instead of having a surplus, is a large consumer of foreign wines. Both the imports and the exports of wine have largely increased of late years.

M. Keléti presents some interesting facts in regard to the social condition of the viticultural population, and the energy and intelligence with which the ravages of insect and fungoid enemies, especially the *oidium tuckeri* and the *phylloxera vastatrix*, are resisted. In a comparison of Hungarian statistics with that of other European countries, he finds a large number of errors in the public estimation of this great branch of production. The results of this industry are mostly overstated. Doubtless a more accurate system of statistics will soon be inaugurated in this as well as in other branches of agricultural production.

THELEMARK CATTLE OF NORWAY.—The Thelemark race is probably the only national breed found in Norway. It is a well-defined mountain-race, and is found in its most characteristic development in the upper districts of Siljiord, Hivideseid, &c. The Thelemarks have a small carcass, full-grown cows rarely exceeding 650 or 750 pounds per head in their native habitat, but they have been observed to increase in size and weight when placed at an early age upon more luxuriant pastures or when furnished with more nutritious food. At the chief farm at Ladegaardsoen they have attained a weight of 1,000 pounds. From midsummer till the middle of September mountain-pastures are quite luxuriant, but the animals are unprotected from the occasional very low temperature of the nights. Graziers are tempted by the abundant supply of summer pasture to graze more animals than they can provide for during winter. This causes a small yield of milk during the cold season, and a thin, impoverished condition in the spring.

The Thelemarks are of slender form, small head, with well-shaped horns, sprightly movement, and bright skin coloring, varying from white to dark red, with spots and brindles. The horns are remarkably transparent, regularly curved outward and a little forward, the points ranging from 24 to 30 inches apart. The eyes are large and lively, nostrils large, ears thin, neck long, back straight, body well rounded, and hind quarters thin.

This breed has fine milking qualities. On the chief farm at Ladegaardsoen it has been for several years superseding other breeds. One of these cows, weighing less than 800 pounds, averaged about 685 gallons per annum during the three years 1868-'70, or about 9 pounds of milk per annum for each pound of live weight. It is noticeable that these cows do not yield so abundantly immediately after calving—seldom over 3½ gallons per day—but their yield is more uniform, and their intervening periods of dryness are comparatively short. The flow of milk increases with the age of the cow. Like other good milk-breeds, the Thelemarks are liable to calving-fever, and hence should be kept on low diet for some time before and after calving.

Great efforts have been made for the improvement of this breed by more careful selection of breeding animals and by better keeping. Every year, in autumn, a cattle-show is held at Siljiord, at which prizes are distributed and lectures given by men skilled in breeding. This occasion has also been improved for the sale and purchase of animals, by the establishment of a regular market. The anxiety felt in regard to the purchase of prize animals by foreigners, and their consequent loss to the country, has been dissipated by the increasing number of fine animals on exhibition. It is found that the general interest in the matter of improvement and the more general effort of farmers has enlarged the number of superior cattle far more than sufficient to make good the

loss by exportation. Prices, also, have nearly doubled in twenty years, ranging now from \$27 to \$34 per head, some rare animals receiving \$56.

But the Thelemarks are not profitable as meat-producers. The bulls are small and insignificant, and on being fattened become sluggish and unserviceable in covering the cows. Hence, Ayrshire bulls have been used in crossing, with considerable improvement in beef-product, but not in milking qualities. But these mixtures of blood are not looked upon with popular favor, and no prizes are awarded in Thelemark to half-breeds. The structure of the latter more closely approximates the Ayrshire than the Thelemark parent. The Ayrshires in Sweden and Norway have, of late years, fallen into discredit, on account of their liability to tubercular disease in that climate; but the mixed progeny has exhibited no such tendency. These take on weight and bring higher prices than the Thelemarks. A considerable export trade of this breed to England is one of the noticeable changes of the day.

ALGERIAN AGRICULTURE.—The French people have never been very successful as colonists, but in their latest enterprise south of the Mediterranean they seem to have planted a very permanent state. A nest of pirates has been cleared out and the highways of civilization secured from destructive incursions. This is, however, not the only benefit which France has conferred upon the civilized world. A large area has been rescued from a shiftless system of agriculture and subjected to a higher production. The semi-nomad population is placed under a *régime* of impartial justice in all the rights of property, but the occasional outbreaks of barbarian hate are punished by extensive confiscations of land, which is allotted to old French settlers and new immigrants in the proportion of one-third to the former and two-thirds to the latter class. This policy is increasing the proportion of civilized elements in the population, and promises to make North Africa an important granary of Europe. About 2,400,000 acres are now occupied for agricultural purposes by 117,175 French colonists, giving to each an average farm of over 20 acres.

During 1874, 742,000 acres were sown by Europeans with cereals, producing about 7,900,000 bushels, or $10\frac{2}{3}$ bushels per acre; 28,000 acres yielded 5,950,000 gallons of wine, or 212 gallons per acre; 2,000 acres produced 1,320,000 pounds of oil-seed, coloring-matter, &c.; 1,458 acres returned 546,400 pounds of cleaned cotton, or about 375 pounds per acre, nearly double the average of our American cotton area in 1872; 6,924 acres yielded 5,932,000 pounds of tobacco, or over 856 pounds per acre; 20,314 acres yielded 8,828,324 pounds of linseed, or nearly 435 pounds per acre. Including European and native farmers, the area in cereals in 1874 was 4,280,384 acres, producing 35,000,000 bushels, or $8\frac{1}{5}$ bushels per acre. Of this product, 7,300,000 bushels, worth \$8,000,000, were exported.

The principal articles of export to Europe are cereals, linseed, vegetable fiber, wool, cattle, hides, oil, tobacco, canes, minerals, and a small quantity of silk, cotton, and madder. Algeria is essentially a pastoral and crop-raising country, but even these pursuits, with the imported capital, labor, and enterprise of the European colonists, are yet in their infancy. The average yields per acre are small for the European colonists and still smaller for the Arab, who, like an American Indian, finds it difficult to throw off his nomadic barbarism and settle down to regular industry. The land is seldom plowed to any depth, is never manured, and, through neglect, is becoming choked with noxious weeds and foul seed. The Arab element, instead of advancing in civilized industry, seems to be declining. While the value of implements owned by Euro-

pean farmers increased, during the five years ending with 1872, from \$1,022,683 to \$1,590,136, that of implements belonging to Arabs decreased from \$366,637 to \$303,126. Arab farmers are gradually getting out of the traces and resuming their wild, nomadic life, and their places are taken by Europeans.

The principal cereals cultivated are hard and soft wheat, rye, barley, oats, maize, beans, and sorghum. The wheat has a special value in European markets for the manufacture of vermicelli and other *patés*. The favorite barley is the variety called by botanists *Hordeum hexartium*, but other varieties have been successfully grown. It is mostly used as horse-feed, but the poorer classes of people also use it. It is grown also as a forage crop, and is well adapted to malting.

Sheep husbandry is one of the most profitable branches of farming in this country, utilizing those high, barren plateaus where cultivation, to any great extent, is impracticable. Before the conquest the Arabs derived but little benefit from their flocks beyond personal subsistence and clothing, on account of lack of market facilities. But the establishment of a settled government by France has opened up this industry to the markets of the civilized world and has given a regular value to its products. Of all classes of farm-animals, including horses, asses, mules, camels, cattle, sheep, goats, and swine, the European colonists, in 1872, owned 392,975, and the Arabs 9,774,852. During the six years previous, those of the Europeans had increased 46,809, while those of the Arabs had decreased 3,688,979.

The Alpha fiber, one of the most important productions of the soil, covers 10,000,000 acres. Its value is beginning to be appreciated as a paper-making material. It is supposed that the crop raised in Algeria can be made to equal in economic value at least three-fourths of the rags gathered in the civilized world. In 1873 it was exported to the extent of 45,000 tons, which rose in 1874 to 58,000 tons, and promised by the close of 1875 to reach 60,000 tons for that year. Increasing facilities of transportation, through railways, will secure the transit of this material to the coast in increasing quantities in years to come, and bring production and consumption into close relations with each other.

The forests are valuable, but are liable to destructive conflagrations. They produce several species of oak, especially the cork-oak, the Aleppo pine, the cedar, and other valuable species of timber. The European colonists are being largely re-enforced by immigration from Alsace and Lorraine, and their villages are being extended to the forest districts. This will render the cutting and marketing of timber a more important interest in years to come.

MARKET-PRICES OF FARM-PRODUCTS FOR OCTOBER 1876.

The following quotations represent, as nearly as possible, the state of the market at the beginning of the month:

Articles.	Prices.	Articles.	Prices.
NEW YORK.		BOSTON—Continued.	
Flour, superfine, State and western, per bbl.	\$4 20 to \$4 75	Beef, mess, per bbl.	\$10 00 to —
extra State, do.	5 00 to 6 30	extra mess, do.	12 00 to —
extra to choice western, per barrel	5 00 to 9 50	family, do.	12 50 to \$13 50
southern extra, per bbl.	5 10 to 6 25	Pork, prime, do.	16 50 to 17 00
Wheat, No. 1 spring, per bush.	6 30 to 8 00	mess, do.	17 75 to 18 00
No. 2 spring, do.	1 18 to 1 30	Lard, per lb.	11 to 11½
winter, red, western, per bushel	1 10 to 1 22	Butter, New York and Vermont, per pound	13 to 33
winter, amber, western, per bushel	1 05 to 1 30	western, per lb.	16 to 33
winter, white, western, per bushel	1 05 to 1 30	Cheese, New York and Vermont factory, per lb.	10 to 13½
Corn, per bush.	1 15 to 1 20	western factory, do.	8 to 13
Oats, do.	56 to 59½	Sugar, fair to good refining, do.	8½ to 9½
Rye, do.	70 to 87	Cotton, low ordinary to good ordinary, per lb.	9½ to 10½
Barley, do.	97½ to 1 25	low middling to good middling, per lb.	10½ to 11½
Hay, baled, first quality, for retail, per ton	20 00 to —	Wool, Ohio and Pennsylvania, per pound	35 to 50
baled, second quality, for shipping, per ton	12 00 to —	Michigan, per lb.	32 to 40
Beef, mess, per bbl.	3 00 to 10 00	other western, do.	32 to 38
extra mess, do.	10 00 to 11 00	pulled, do.	20 to 40
Pork, mess, do.	16 70 to —	combing fleece, do.	48 to 50
extra mess, do.	— to —	California, do.	14 to 30
prime mess, do.	19 50 to —	PHILADELPHIA.	
Lard, per lb.	9½ to 10½	Flour, superfine, per bbl.	3 50 to 3 75
Butter, western, do.	18 to 37	Pennsylvania extra to choice, per bbl.	4 00 to 6 50
State dairy, do.	29 to 38	western extra to choice, per barrel	5 75 to 7 00
Cheese, State factory, do.	10 to 13½	Wheat, white, per bush.	1 25 to 1 35
western factory, do.	8 to 11½	amber, do.	1 23 to 1 28
Sugar, fair to prime refining, per pound	8½ to 9½	red, do.	1 05 to 1 23
Cotton, ordinary to good ordinary, per lb.	93-16 to 101-16	Rye, do.	70 to 78
low middling to good middling, per lb.	109-16 to 117-16	Corn, do.	54 to 59
Tobacco, lugs, per lb.	5½ to 9	Oats, do.	30 to 42
leaf, do.	8 to 13½	Hay, baled, prime, per ton	14 00 to 18 00
Wool, American XXX and picklock, per lb.	46 to 48	baled, common to fair ship-ping, per ton	10 00 to 13 00
American X and XX, per pound	32 to 45	Beef, western mess, per bbl.	6 00 to 8 00
American, combing, per lb.	44 to 50	extra mess, do.	10 00 to 11 00
California spring clip, per pound	16 to 28	Warthman's and Alburger's city family, per barrel	13 00 to —
California fall clip, per lb.	11 to 21	rel., do.	17 50 to 18 00
pulled, do.	22 to 40	Pork, mess, per bbl.	16 00 to 17 00
BOSTON.		prime mess, do.	— to —
Flour, western superfine, spring, per barrel	4 25 to 4 50	extra prime, do.	— to —
common spring extra, per barrel	4 75 to 5 50	Lard, per lb.	10½ to 15
good to fancy northwest-ern spring, per bbl.	5 75 to 9 25	Butter, choice Middle State, do.	28 to 38
good to fancy western winter, per bbl.	6 00 to 8 50	choice western, do.	— to —
southern family, per bbl.	6 50 to 8 50	Cheese, New York factory, per lb.	3½ to 11½
Wheat, No. 1 spring, per bush.	1 05 to 1 35	Ohio factory, do.	3 to 11½
Corn, do.	55 to 64	Sugar, fair to good refining, per lb.	8½ to 9
Oats, do.	35 to 50	Cotton, ordinary to good ordinary, per lb.	8½ to 9½
Rye, do.	75 to 80	low middling to good middling, per lb.	10½ to 11½
Barley, do.	95 to 1 20	Wool, Ohio and Pennsylvania X to XXX, per lb.	41 to 45
Hay, eastern and northern, per ton	12 00 to 20 00	other western, do.	36 to 38
western choice, per ton	17 00 to 19 00	pulled, do.	22 to 36
		combing, washed and unwashed, per pound	37 to 50
		tub-washed, do.	30 to 45
		BALTIMORE.	
		Flour superfine, per bbl.	3 50 to 4 50
		extra, do.	4 75 to 5 50
		family, do.	5 75 to 8 25

Market-prices of farm-products—Continued.

Articles.		Prices.		Articles.		Prices.	
BALTIMORE—Continued.				CHICAGO—Continued.			
Wheat, red	per bush.	\$1 15 to	\$1 30	Wheat, No. 1 spring ...	per bush.	\$1-12 to	—
amber	do.	1 33 to	1 38	No. 2 spring	do.	1 10 to	\$1 10½
white	do.	1 20 to	1 35	No. 3 spring	do.	92 to	—
Rye	do.	60 to	65	Rye, No. 2	do.	61 to	—
Oats	do.	34 to	45	Barley, No. 2	do.	85 to	87
Corn	do.	53½ to	59	Corn, No. 2	do.	46½ to	47½
Hay, Maryland and Pennsyl-				Oats, No. 2	do.	33½ to	34
vania	per ton.	19 00 to	20 00	Hay, timothy	per ton.	10 00 to	11 25
western	do.	— to	—	prairie	do.	7 00 to	8 00
Pork, mess	per bbl.	18 25 to	—	Beef, mess	per bbl.	10 75 to	11 00
prime	do.	— to	—	extra mess	do.	11 75 to	12 00
extra prime	do.	17 00 to	—	Pork, mess	do.	16 20 to	16 50
Lard	per lb.	10½ to	12	prime mess	do.	— to	—
Butter, western	do.	16 to	30	extra prime	do.	13 50 to	—
eastern	do.	22 to	27	Lard	per lb.	9½ to	10½
Cheese, western factory	do.	10 to	12	Butter, choice to fancy	do.	27 to	32
eastern factory	do.	12 to	13½	medium to good	do.	20 to	24
Sugar, fair to good refining	do.	8½ to	9	Cheese, good to choice factory,			
New Orleans, grocery				per pound		11½ to	12½
grades	per lb.	— to	—	Sugar, New Orleans	per lb.	— to	—
Tobacco, lugs	do.	6½ to	9	Wool, tub-washed	do.	39 to	40
leaf, common to medium,				fleece-washed	do.	34 to	37
per pound		9 to	11	unwashed	do.	23 to	24
Cotton, ordinary to good ordi-				pulled	do.	— to	—
nary	per lb.	8½ to	9½	SAINT LOUIS.			
low middling to good				Flour, winter, common to choice,			
middling	per lb.	10½ to	11½	per barrel		3 25 to	7 00
Wool, tub-washed	do.	35 to	40	spring	per bbl.	— to	—
fleece-washed	do.	28 to	33	Wheat, red winter	per bush.	1 03 to	1 17
pulled	do.	23 to	35	white winter	do.	— to	—
unwashed	do.	24 to	28	spring	do.	1 03 to	1 17
CINCINNATI.				Oats	do.	30 to	36½
Flour, superfine	per bbl.	3 75 to	4 25	Corn	do.	39 to	45
extra	do.	4 75 to	5 25	Rye	do.	42 to	52
family and fancy	do.	5 40 to	7 00	Barley, fair to choice	do.	— to	95
Wheat, winter, red	per bush.	1 05 to	1 13	Hay, timothy	per ton.	11 00 to	13 00
hill, (amber)	do.	1 17 to	1 25	prairie	do.	7 00 to	11 00
white	do.	1 17 to	1 25	Beef, mess	per bbl.	13 50 to	14 00
Oats	do.	28 to	43	Pork, mess	do.	17 50 to	18 00
Corn	do.	47 to	48	Lard	per lb.	14 to	16
Rye	do.	60 to	67	Butter, prime to choice dairy,			
Barley	do.	1 00 to	1 15	per pound		26 to	30
Hay, baled, No. 1	per ton.	11 00 to	12 00	country packed	per lb.	20 to	25
lower grades	do.	9 00 to	10 00	Cheese, Ohio factory	do.	12½ to	13½
Pork, mess	per bbl.	17 00 to	—	N. Y. factory	do.	13 to	14
Lard	per lb.	10½ to	11½	Cotton, ordinary to good ordi-			
Butter, choice	do.	20 to	35	nary	per lb.	8½ to	9½
prime	do.	20 to	23	low middling to good			
Cheese, prime to choice factory,				middling	per lb.	10 to	11
per pound		12½ to	13	Wool, tub-washed	do.	33 to	40
Sugar, New Orleans, fair to good,				fleece-washed	do.	— to	—
per pound		— to	—	unwashed	do.	24 to	31
prime	per lb.	— to	—	Tobacco, lugs	do.	33 to	4½
Tobacco, lugs	do.	— to	—	common to shipping,			
leaf	do.	— to	—	leaf	per lb.	5 to	12
Cotton, ordinary to good ordi-				NEW ORLEANS.			
nary	per lb.	8½ to	9½	Flour, superfine	per bbl.	3 75 to	4 00
low middling to good				extra	do.	4 25 to	5 50
middling	per lb.	10½ to	10½	choice to fancy	do.	5 75 to	7 25
Wool, fleece-washed	do.	30 to	32	Corn, white and yellow	per bush.	50 to	65
tub-washed	do.	28 to	36	Oats	do.	47 to	55
unwashed, clothing	do.	22 to	23	Hay, choice	per ton.	21 00 to	—
unwashed, combing	do.	27 to	31	prime	do.	17 50 to	18 00
pulled	do.	24 to	26	Beef, Texas	per bbl.	10 00 to	—
CHICAGO.				western	do.	13 00 to	14 00
Flour, choice winter extras,				Fulton market	per bbl.	9 75 to	10 00
per barrel		6 50 to	—	Pork, mess	per bbl.	18 75 to	19 00
common to good winter				Lard	per lb.	11½ to	12
extras	per bbl.	5 50 to	6 00	Butter, choice Goshen	do.	35 to	—
spring extras, common to				choice western	do.	25 to	—
good	per bbl.	5 00 to	5 25	Cheese, choice western factory,			
spring extras, choice	do.	5 25 to	5 75	per pound		13 to	14
patent spring	do.	5 75 to	7 50	N. Y. cream	per lb.	15 to	16
spring superfines	do.	3 00 to	3 50	Sugar, fair to fully fair	do.	— to	—
				prime to strictly prime,			
				per pound		— to	—

Market-prices of farm-products, &c.—Continued.

Articles.	Prices.	Articles.	Prices.
NEW ORLEANS—Continued.		SAN FRANCISCO—Continued.	
Sugar, clarified, white, and yellow per lb.	\$0 11 to \$0 11½	Barley per cental.	\$0 90 to \$1 10
Cotton, ordinary to good ordinary per lb.	8½ to 9½	Oats do.	1 40 to 1 75
low middling to good middling per lb.	9½ to 10½	Corn do.	1 15 to 1 25
Tobacco, lugs do.	5½ to 8	Hay, State per ton.	7 50 to 13 00
leaf, low to medium, per pound	8½ to 12	Pork, mess per bbl.	23 00 to 24 00
SAN FRANCISCO.		prime mess do.	17 50 to 18 50
Flour, superfine per bbl.	4 00 to 4 25	Beef, mess do.	9 00 to 10 00
extra do.	4 50 to 4 75	family mess per ½ bbl.	8 50 to 10 00
family and fancy do.	5 00 to 5 25	Lard per lb.	13½ to 15
Wheat, California per cental.	1 50 to 1 62½	Butter, overland do.	16 to 18
Oregon do.	1 50 to 1 60	California do.	25 to 45
		Oregon do.	20 to 25
		Cheese do.	12½ to 15
		Wool, native do.	10 to 12
		California do.	15 to 22
		Oregon do.	20 to 25

LIVE-STOCK MARKETS.

NEW YORK.		CHICAGO—Continued.	
Cattle, extra beefs . . . per cental.	\$9 50 to \$10 75	Sheep per cental.	\$2 75 to \$4 50
good to prime do.	8 00 to 9 00	Swine do.	5 00 to 6 30
common to fair do.	6 00 to 7 50	SAINT LOUIS.	
Texans and Cherokees, per cental.	6 00 to 7 50	Cattle, good to choice native steers, per cental.	4 50 to 4 90
bulk of sales do.	— to —	common to fair natives, per cental.	3 25 to 4 25
average do.	— to —	inferior to common natives per cental.	2 00 to 3 25
milk-cows per head.	50 00 to 75 00	Texans, fair to choice, per cental.	3 00 to 4 00
veal calves per cental.	5 50 to 9 50	Sheep per cental.	2 50 to 4 50
Sheep do.	4 00 to 6 75	Swine do.	5 50 to 6 25
Swine do.	6 65 to 7 00	Horses, plugs per head.	30 00 to 65 00
PHILADELPHIA.		plain do.	50 00 to 90 00
Cattle, choice beefs . . . per cental.	5 75 to 6 25	street-car do.	75 00 to 125 00
fair to good do.	4 62½ to 5 50	good to extra draught, per head	100 00 to 130 00
common do.	3 00 to 4 50	good drivers per head.	175 00 to 225 00
Sheep do.	1 50 to 5 75	extra do.	225 00 to 250 00
Swine, corn-fed do.	8 75 to 9 25	auction, and ponies, per head	25 00 to 45 00
BALTIMORE.		Mules, 14 to 15 hands high, per head	85 00 to 120 00
Cattle, best beefs . . . per cental.	4 87 to 5 25	15 to 16 hands high, per head	115 00 to 150 00
first quality do.	4 00 to 4 87	extra per head.	175 00 to 185 00
medium or good quality, per cental.	3 25 to 4 00	NEW ORLEANS.	
ordinary per cental.	2 50 to 3 25	Cattle, Texas beefs, choice, per head	40 00 to —
general average of the market per cental.	3 87 to —	first quality per head.	35 00 to —
most of the sales . . . do.	3 25 to 4 25	second quality do.	30 00 to —
Sheep per cental.	2 00 to 5 25	western beefs, per cental.	— to —
Swine do.	7 50 to 8 75	milk-cows per head.	40 00 to 90 00
CINCINNATI.		veal calves do.	7 00 to 9 00
Cattle, good to choice native steers per cental.	4 00 to 4 65	Sheep do.	2 00 to 6 00
fair to medium do.	2 75 to 3 75	Swine do.	6 00 to 8 00
common do.	2 00 to 2 50	Horses, good combined do.	150 00 to 200 00
milk-cows per head.	— to —	good plugs do.	100 00 to 150 00
veal calves per cental.	— to —	common do.	40 00 to 80 00
Sheep do.	2 25 to 4 50	Mules, first-class, broken do.	175 00 to 200 00
Swine do.	5 00 to 6 15	good, suitable for sugar-making, broken, per head	175 00 to 225 00
CHICAGO.		Small, suited to rice and cotton planters, broken, per head	100 00 to 150 00
Cattle, choice beefs, 1,300 to 1,500 pounds . . . per cental.	4 60 to 5 00	Green mules generally sell about \$10 less per head than broken ones.	
good beefs, 1,200 to 1,350 pounds . . . per cental.	4 25 to 4 50		
medium grades, 1,050 to 1,200 pounds . . . per cental.	3 25 to 4 00		
inferior natives do.	1 50 to 2 00		
Texans, through droves, per cental	2 10 to 3 00		

FOREIGN MARKETS.

WHEAT.—Autumnal weather in the British Islands has hitherto been, on the whole, unfavorable to agricultural operations, the rain-fall being excessive, and the temperature, except in a few brief intervals of sunshine, being low for the season. North British farmers in most cases succeeded in getting their grain secured in good order, but others were disappointed, being compelled to clear their fields for fall plowing, and, consequently, to house their crops in unfavorable weather. In Ireland farmers enjoyed better opportunities for securing their crops. The same causes have hindered the thrashing of the grain, and consequently the amount of the new crop marketed is small, and that of poor quality, from damp and inferior condition. This kind of wheat can be disposed of only at a decline of 1s. per quarter from the previous rates, and even at these depressed prices the trade is by no means brisk. The average imports into the United Kingdom since harvest were but little more than half the amounts of the corresponding period of 1875, when the stocks of old British wheat left over were increasing; they are now gradually declining. The shipments from the Atlantic ports of the United States and Canada for the four weeks ending September 25 were 228,000 quarters less than during the same period of 1875. British dealers and consumers are beginning to feel some anxiety at the slowness with which supplies are arriving from the United States and Russia, a fact which indicates a speedy rise in prices. The possibilities growing out of a war in Southeastern Europe have had an unsettling effect upon the market. As Russia is the main source of supply of red wheat, a rupture between her and the British government would cut off one of their leading sources of supply, and would gravely affect the prices of subsistence in the British Islands.

The imports of wheat into the United Kingdom during the last week of September amounted to 537,622 cwt. The sales of English wheat during that week amounted to 65,758 quarters, at 47s. per quarter, against 51,830 quarters, at 47s. 1d. per quarter, during the corresponding week of 1875; the London averages were 49s. 7d. on 4,057 quarters. During the first week of September the sales of English wheat were 67,158 quarters, at 47s. 1d., against 59,122 quarters, at 45s. 11d., the previous year; London averages, 3,961 quarters, at 47s. 1d.

The first week in September opened in London with very little animation; native wheat received, 7,754 quarters; foreign, 23,015, mostly from Russia; no supplies from American Atlantic ports. Essex and Kent white brought, in Mark Lane, from 45s. to 50s. per quarter; ditto, red, 43s. to 47s.; Dantzic mixed, 50s. to 54s.; Königsberg, 49s. to 53s.; Rostock, new, 50s. to 52s.; Pomeranian, Mecklenburg, and Uckermark, red, 48s. to 50s.; Gbirka, 42s. to 44s.; Russian, hard, 42s. to 43s.; Saxonska, 43s. to 47s.; Danish and Holstein, red, 46s. to 49s.; American, red, 50s. to 51s.; Chilian, white, 46s.; Californian, 50s.; Australian, 50s. to 51s.

In Liverpool, British white was quoted at 9s. 6d. to 10s. 2d. per cental; ditto red, 9s. 2d. to 9s. 10d.; Canadian white, 9s. 10d. to 10s. 3d.; Red Club and Golden Drop, 9s. 8d. to 10s. 2d.; American red winter, 9s. 3d. to 10s. 3d.; No. 1 spring, 9s. 7d. to 9s. 9d.; No. 2 spring, 9s. 1d. to 9s. 6d.; No. 3 spring, 8s. 2d. to 8s. 9d.; Bombay, 9s. to 9s. 6d.; Calcutta, 8s. 2d. to 9s.; Saidi, 7s. 2d. to 7s. 4d.; Bubi, 7s. 9d. to 8s. 9d.; California, 10s. 2d. to 10s. 4d.; Club, 10s. 6d. to 10s. 8d.; Oregon, 10s. 5d. to 10 7d.; Chilian, 9s. 5d. to 9s. 9d.; Australian, 10s. 6d. to 10s. 8d.

In France October opened with spring-like temperature, and the dis-

tricts north of the Loire were enabled to resume their labors in the field that had been interrupted by bad weather. Wheat-sowing was in rapid progress. The country markets were dealing mostly in seed-wheats, and very few lots for grinding had found sale. An advance in prices was noticed in 16 provincial markets, against 21 at the close of the previous week; 78 remained calm to firm, against 58 the previous week; 11 showed decline, against 16 the previous week. At Paris the demand for wheat on the spot was slow; the transactions were few and at low prices; ordinary qualities ranged from 49s. 2d. to 51s. 5d. per quarter; the best white sorts reached 52s. 9d.

At Marseilles 50,000 quarters arrived during the last week in September, and the stock on hand was estimated at 150,000 quarters. The Belgian, Dutch, and German markets exhibited but little animation. The weather was generally unfavorable for sowing, and in some parts of Germany crops not housed were injured by excessive rains.

FLOUR.—The imports of flour into the United Kingdom during the first week in October amounted to 140,362 cwt. against 110,636 cwt. the previous week. Supplies of English flour were good in London, and previous prices were with difficulty maintained. In Mark Lane the best town households was quoted at 36s. to 43s. per 280 pounds; best country households, 34s. to 36s.; Norfolk and Suffolk, old, 31s. to 32s.; French, 30s. to 35s.; American, 22s. to 23s. per barrel of 190 pounds; ditto extra and double extra, 23s. to 24s. At Liverpool, English and Irish superfines brought 37s. to 39s. per 280 pounds; ditto extra, 40s. to 46s.; French, 38s. 6d. to 46s. 6d.; Trieste, 47s. 6d. to 55s.; Californian, 37s. to 40s.; American, western, and extra State, 22s. 6d. to 25s. per barrel; Baltimore and Philadelphia, 22s. 6d. to 26s.; Ohio and extra, 23s. 6d. to 26s. 6d.; extra Canadian, 25s. to 27s.; Canadian patent barrel, 29s. to 33s. At Paris, superior flour, to be delivered in October, was quoted at 36s. 8d. to 36s. 10d., the longer futures being increased.

MAIZE.—The imports of maize into the United Kingdom during the first week of October amounted to only 17,780 quarters against 42,278 quarters the week immediately previous. The trade ruled quiet and prices easier. In Mark Lane white maize was quoted at 26s. to 27s. per quarter; yellow, 25s. to 26s. per quarter. In Liverpool, American white brought 30s. per 480 pounds; ditto, mixed, 26s. to 26s. 3d.; Galatz, 27s. to 27s. 6d.; Danubian, 25s. 6d. to 25s. 9d.; Dari, 27s. to 27s. 6d.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

NOVEMBER AND DECEMBER, 1876.



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1876.

MONTHLY REPORT.

STATISTICAL DIVISION,
DEPARTMENT OF AGRICULTURE,
Washington, D. C., December 26, 1876.

SIR: I present herewith, for publication, a digest of current statistical returns; a statistical argument showing that production is not declining; a report upon the work of European experiment-stations; notes on the work of the Chemist and Microscopist; and miscellaneous statistics and domestic and foreign market-reports.

Respectfully,

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

CORN.

The returns of November make the corn crop only 2 per cent. short of the great crop of last year, and fully 50 per cent. greater than the crop of 1874. The aggregate is 1,295,000,000 bushels. Less than 1 per cent. of the crop is raised in New England, scarcely 5 in the Middle States, 20 in the Southern, 44 in the Ohio basin, and 29 west of the Mississippi.

The product of the South is 10,000,000 bushels greater than last year, that of New England is 300,000 greater, and there is less in the Middle and Western States. It is 73,000,000 greater than in 1870, and yet the percentage of the total crop of these States is only 20 against 23 in the census-year, because the increase has been still greater in the West. In 1850, the proportion of these States was 42 per cent. of the aggregate, and, in 1860, 32. Thus, while the South is increasing its corn product, there is profitable opportunity for a much larger increase.

The States of the Ohio basin, seven in number, including Michigan and Wisconsin, increased their proportion from 39 per cent. in 1850 to 41 in 1860, and since that date continue to advance their proportions, the percentage being 44 in 1870 and at the present time, notwithstanding the more rapid progress of corn-growing in the States of the Missouri Valley.

These States, Minnesota, Iowa, Missouri, Kansas, and Nebraska, produced only 7 per cent. in 1850, advancing to 15 in 1860, to 21 in 1870, and 28 in 1876. The increase in Kansas has been most rapid of late, nearly equaling in amount in this year the crop of the much more populous State of Missouri. Iowa, as yet, grows more than four-tenths of the crop of this section.

The States producing less than in 1875 are New Hampshire, Rhode Island, those of the Atlantic coast from New York to North Carolina, Mississippi, Tennessee, Michigan, Illinois, Iowa, and Missouri. Illinois is credited with about 250,000,000 bushels, and Iowa with 155,000,000. Next in rank are Ohio, Indiana, Missouri, and Kansas. These six States produce six-tenths of the total product. Tennessee, which once held the highest rank in the country, now stands first in the Southern States, followed by Texas, Alabama, and Georgia.

By far the heaviest rate of increase, 75 per cent., has been in Wisconsin, where the crop of last year was a very poor one.

The extension of this culture westward continues to be rapid. This year, the Missouri Valley, together with the western half of the Upper Mississippi, yields two-thirds as much as the area from that river eastward to Pennsylvania, including the States on both sides of the Ohio.

In quality, the crop is superior to its predecessor. New Hampshire is an exception in New England. In New Jersey, there was injury by drought. North Carolina and Florida are slightly below the standard; and slight inferiority is indicated in Mississippi, Louisiana, Arkansas, Tennessee, Missouri, and Nebraska. In some portions of the South and West, there is complaint of rotten and worm-eaten corn. In all the States, the crop, as a whole, reached full maturity without injury by frost.

There has been an increase of area in all sections, aggregating about two million acres, the advance very slight in the Gulf States from Alabama to Louisiana, and scarcely perceptible in the Middle States. It is largest west of the Missouri. Wisconsin shows the heaviest increase in the Northwest, and Texas and Georgia in the South.

COTTON.

The returns of November indicated an extremely favorable season for gathering cotton, except in some portions of North Carolina. The following synopsis was telegraphed last month: "Frost has injured the top crop in the northern belt, notably in Arkansas. The fiber is cleaner than usual and of superior quality in the southern belt. Drought in the Gulf States, rain-storms in the Carolinas, the boll-worm in the Southwest, and the caterpillar in certain locations near the Gulf coast are chief causes of injury to the crop. The harvest will be completed at a much earlier date than usual. The crop must be smaller than that of last year, however favorable and long the remaining season for gathering. In comparison with the last crop, the percentages of the Atlantic coast States are relatively larger by reason of the poor returns of 1875, and smaller in the Southwest from comparison with the remarkable yield of that region. They are as follows: North Carolina, 92; South Carolina, 99; Georgia, 110; Florida, 100; Alabama, 77; Mississippi, 78; Louisiana, 83; Texas, 100; Arkansas, 74; Tennessee, 101. The average is between 88 and 89."

To facilitate comparison with returns of former years, the following tables of condition since 1870, for the last two months in which the condition of the growing crop is reported, are presented, averages be-

ing corrected by due consideration of the difference in production of the several States :

OCTOBER.

States.	1876.	1875.	1874.	1873.	1872.	1871.
North Carolina.....	84	85	85	88	90	80
South Carolina.....	80	77	82	80	86	75
Georgia.....	85	71	80	82	88	72
Florida.....	80	70	81	76	75	73
Alabama.....	70	94	75	78	82	75
Mississippi.....	83	96	74	75	78	76
Louisiana.....	82	90	62	72	72	73
Texas.....	91	88	70	80	85	72
Arkansas.....	86	103	55	83	75	82
Tennessee.....	91	90	56	90	90	94
Apparent average	83.2	86.4	72	80.4	82.1	77.2
Corrected average	82.7	88.0	71.7	79.3	81.8	76.7

SEPTEMBER.

States.	1876.	1875.	1874.	1873.	1872.	1871.
North Carolina.....	93	90	87	95	101	82
South Carolina.....	91	80	86	86	95	80
Georgia.....	90	76	77	90	96	78
Florida.....	83	75	77	85	92	75
Alabama.....	83	87	81	85	83	80
Mississippi.....	87	98	74	82	90	80
Louisiana.....	90	88	62	80	86	77
Texas.....	87	94	65	92	94	80
Arkansas.....	97	99	47	93	78	95
Tennessee.....	119	96	52	92	92	96
Average.....	90.5	89.2	71.0	87.9	90.7	81.5

We further give the record of condition during each month of the present year :

States.	June.	July.	August.	Septem-ber.	October.
North Carolina.....	101	105	96	93	84
South Carolina.....	98	90	97	91	80
Georgia.....	103	103	104	90	85
Florida.....	82	98	89	83	80
Alabama.....	94	100	103	83	70
Mississippi.....	92	94	92	87	83
Louisiana.....	89	89	89	90	82
Texas.....	90	99	106	87	91
Arkansas.....	95	97	98	97	86
Tennessee.....	93	103	120	119	91
Average.....	94.4	97.3	99.4	90.5	82.7

It will be seen that, in 1875, the September average, 89.2, was only reduced to 88 in October; while the September figures of this year, 90.5, fell in October to 82.7. The season for gathering has continued very favorable, and the harvest is more nearly completed than for several years at this season.

We have collected no systematic reports in December, and therefore place on record only the condensed results of the previous returns of the season as factors in the calculations concerning the possible crop. The appropriation for the support of this division for the present fiscal year being inadequate even to the office-work of record and compilation,

and the printing-fund being already nearly exhausted, there is little inducement to attempt investigations which cannot be properly made, or published if made.

POTATOES.

As returns for condition, during the latter part of the season, have foreshadowed, the potato crop, in production, falls not only far below the extraordinary crop of 1875, but considerably below an average crop. Among the causes of diminished yield, drought was the most widespread and effective. During the season for the formation and growth of the tubers, excessively dry weather prevailed, with a few local exceptions, throughout the entire section north of the thirty-sixth parallel and east of the Rocky Mountains, the section in which the potato crop is mainly grown. The drought was the most severe and protracted in the Middle and Eastern States, except a northern belt including the greater part of Maine. Within this designated area also the beetles east of the Mississippi and the grasshoppers west effected some reduction in localities, though not to a serious extent. Reduction by premature decaying of the vines, from blight or rust, is noted in New York, (Wyoming and Chautauqua,) Pennsylvania, (Sullivan,) Virginia, (Pulaski,) Ohio, (Franklin,) Michigan, (Iosco, Montcalm, and Fond du Lac,) Wisconsin, (Outagamie,) and California, (Humboldt and Sonoma;) by rotting, in Virginia, (Highland,) North Carolina, (Beaufort and Haywood,) West Virginia, (Pocahontas, Upshur, and Braxton,) Ohio, (Lorain and Preble,) Michigan, (Chippewa and Kent,) Illinois, (Saline and De Kalb,) Wisconsin, (Grant, Brown, Clark, and Jackson,) Iowa, (Jones and Howard.) Another cause of diminished production is an unusual decrease in acreage, especially in States which grow this crop extensively, amounting to 15 per cent. in New York, 31 in New Jersey, 7 in Pennsylvania, 11 in Ohio, and 8 in the entire country. This was occasioned, in part, by the very low prices realized for last year's crop. Among the Northern States east of the Mississippi, Maine alone wisely planted an undiminished acreage; and her farmers are now being well rewarded by very remunerative prices for a crop which averages only 3 per cent. below that of last year in production, while it is 6 per cent. above in quality. Vermont has the next best crop in the eastern section, falling 13 per cent. below that of 1875; while Connecticut falls 50 and Rhode Island 85. The great failure in the latter State was owing to a drought protracted beyond precedent, helped efficiently in its work of reduction by the beetle. New York, growing one-fifth of the entire crop, and more than twice the quantity of any other State, falls off from last year 49 per cent.; other States, (in the order of importance,) fall off, Pennsylvania, 44 per cent.; Ohio, 32; Illinois, 36; Michigan, 53; Wisconsin, 10; Iowa, 34; Indiana, 20; New Jersey, 68.

The small crop grown in the southern section approached nearer to last year's production; equaling it in Alabama, and rising 1 per cent. above it in South Carolina. These States and Oregon, 114, are the only ones in which the production is not below that of last year. The entire crop is about 34 per cent. less than the previous one. There is also a very general decline in quality. Maine, 106; Delaware and South Carolina, 100; Kentucky and Oregon, 101, are the only States not indicating a decline. The lowest figures are in Rhode Island, 44; followed by Connecticut, 64; New Jersey, 68; New York, 81; Pennsylvania, Michigan, and Kansas, 84. Other States range from 88 to 99.

A few items among the local details are worthy of mention. In Kent, Rhode Island, owing to ravages of the beetle, none except the very

earliest came to maturity. Gloucester, New Jersey, did not produce nearly a sufficiency for home use. In Pennsylvania, Sullivan reports that early decay of the vines rendered the late-planted not worth digging, and proved nearly fatal to the whole crop; Beaver, that the yield does not average over 20 bushels per acre, and they are rotting. In Dorchester, Maryland, the beetle occasioned an inferior crop in both yield and quality. In Virginia, early frost reduced the crop 20 to 50 per cent. in Elizabeth City; and in Dinwiddie, early drought prevented most of the crop from vegetating. In Haywood, North Carolina, "a peculiar rot," new to that locality, greatly diminished the product. In Hunt, Texas, the crop was so abundant that growers gave one-half of the product for harvesting. Williamson, Tennessee, reports a product so large that immense quantities were being shipped north and south. The crop has rotted to such an extent in Pocahontas, West Virginia, that scarcely enough are left for seed. In Ohio, while Hancock, Clark, Hocking, Warren, Montgomery, and Miami return fine crops, Medina reports the poorest for ten years; Seneca, the poorest for many years; and Preble, a large portion of the product worthless, though appearing sound on the exterior. Michigan reports like contrasts; Delta returning a good crop of first-rate quality; but Oakland the poorest ever grown, in both yield and quality.

Among the agricultural products of Juneau, Wisconsin, the potato crop was the most profitable, yielding 200 bushels per acre, and selling at 40 to 45 cents per bushel. In Clackamas, Oregon, on the 1st of October, many fields were still green and growing. Early frosts of unprecedented severity greatly damaged the crop in Utah.

Prices have been incidentally stated by our reporters, in different sections; in New York, Washington, 65 cents against 20, last year; Indiana, Kosciusko, 60 to 80 cents, and advancing; Illinois, Boone, 60 cents against 10 last year, and scarcely any sale at that; Missouri, Cole and Holt, 25 cents; Kansas, Cowley and Woodson, 50 cents, and in the latter "will soon be \$1."

SWEET POTATOES.

The crop of 1875 was a fair one in both yield and quality; that of this year very nearly equals it in both respects. The greatest falling-off in yield is in Louisiana, 25 per cent., owing to a general and severe drought at the critical season. The same cause, operating in a less degree, reduced the product below that of last year, 13 per cent. in Florida and Alabama; 12, in Mississippi; and 7, in Georgia. The average reduction is not over 3 per cent. in any other State, while in a majority of those producing the crop the yield equals or exceeds that of 1875. The excess averages 11 per cent. in Kentucky, 9 in New Jersey, 8 in South Carolina, 7 in Missouri, 5 in Delaware, 4 in California, and 2 in Tennessee, West Virginia, Indiana, and Kansas. A majority of the States growing sweet potatoes and those producing the larger part of the crop also report an average quality equaling or exceeding that of the previous crop.

HAY.

The reported entire product is 8 per cent. above that of last year, and the average quality about 5 per cent. better. Maine returns a product 2 per cent. greater than that of 1875, which was 10 per cent. above the previous crop. In the other New England States, there is a decline in product, averaging 12 per cent., owing to the severity of the drought before the crop was cut. In the remainder of the country, except on

the northern border of the Gulf, where but little hay is grown or saved, the crop was generally in advance of the drought; the dry weather commencing about the time of harvesting, and thus greatly contributing to good curing. The only States out of New England not returning a product greater than in 1875 are New York, Delaware, and Alabama, 100; Mississippi, 93; Louisiana, 88; Kansas, 97; Nebraska, 95. The falling-off in the latter two States is owing, in part at least, to the fact that better cereal crops than last year weakened the motives for "putting up wild hay." States indicating a large relative increase in product are California, 59 per cent.; Virginia, 35; Kentucky, 33; New Jersey, 30; Illinois, 20; Tennessee, West Virginia, and Ohio, 15; Texas, 14; Michigan, 13; Arkansas, 11.

As a rule, to which the exceptions are few and slight, the quality is superior to that of last year's crop, both in respect to intrinsic excellence and the condition in which it was cured and housed or stacked. The States returning an average quality not superior to that of the previous crop are Maryland, 100; North Carolina, 99; Mississippi, 95; Louisiana and Arkansas, 97; Minnesota and Oregon, 98. Indiana reports an average superiority of 21 per cent.; Kentucky, 15; Vermont, Ohio, and Illinois, 11. In the latter two States, the crop was greatly damaged last year by excessive rains during the entire harvest season. Our reporters this year occasionally note injuries by wet weather in harvest, the most important of which are injuries to the clover crop, while curing, in parts of Indiana and Illinois; but statements that the crop was cured without injury, or in the best condition, are the rule. County returns of unprecedented crops are frequent. In Pennsylvania, Sullivan reports a crop more abundant than ever before; Tioga, the heaviest product ever gathered, all housed in good condition. The product in Henrico, Virginia, was never exceeded; Bath also produced much the best crop for years, and secured it in excellent condition. Williamson, Tennessee, reports immense quantities, mostly German millet, put up in fine condition; Lincoln, Kentucky, an immense crop of excellent quality; Sandusky, Ohio, the best crop ever grown. Unprecedented and well-saved crops are also returned from Howard and Wabash, Indiana; Fayette, Illinois; Walworth and Outagamie, Wisconsin; Henry, Iowa; Maries, Missouri; and Sonoma and Placer, California.

BEANS.

Returns from all sections indicate that the product is about 7 per cent. less than last year. Grasshoppers in the Northwest and drought in other sections are the principal causes of reduction. The States in which the product is not less than in 1875 are Delaware, 100; Vermont, 101; California, 102; North Carolina, 103; Florida and Arkansas, 105; Wisconsin, 110; Oregon, 122. Among these States, last year, Wisconsin reported 85 and California 82, as compared with the crop of 1874. As dry weather prevailed very generally during the season of curing, the quality (which is not specifically reported) is probably better than average.

PEAS.

In the Northern States, returns for this crop have exclusive reference to the product of shelled peas, for table use or for provender; but in the Southern States, while varieties for table use are included, the principal crop is of the variety known as cow-peas, of which the vines constitute an important forage-product. Texas returns a product 5 per cent.

above a fair crop in 1875; but, in all the other Gulf States, the product was largely reduced by drought. In Clarendon, South Carolina, and Wilkes, Georgia, the crop was also damaged by early frost. In the northern tier of Southern States the product fully equals that of last year. Among the Northern States, Minnesota returns a product 38 per cent. above last year's short crop; Vermont and Delaware return 100. In the remaining States east of the Missouri, the product falls somewhat below that of 1875. Kansas reported last year 33 per cent. above the previous crop; this year 21 below, reduced by grasshoppers. Nebraska, last year, 122; this year, 100. California produced 5 per cent. above a short crop last year. The entire product is about 5 per cent. short of that of 1875.

BUCKWHEAT.

Last year the product exceeded that of the previous crop; this year it falls about 8 per cent. short. Drought at the time of filling was the principal cause of reduction; but in parts of Pennsylvania, Maryland, and Virginia, storms of rain and wind in harvest, or after the crop was matured, did much injury. In parts of the Ohio Valley, the crop did not fill well, owing to excessive wet weather. It was damaged by frost in Saginaw and Oakland, Michigan; Stark, Indiana; and Jefferson, Missouri; and much reduced by grasshoppers in Iowa, Kansas, Nebraska, and Colorado. Massachusetts and Connecticut report a product equal to last year's; but in New York it was 34 per cent. less; New Jersey, 23; Pennsylvania, 26. North of the Ohio, the comparative figures for 1875 and 1876 are, respectively, in Ohio, 105 and 90; Michigan, 132 and 88; Indiana, 112 and 92; Illinois, 83 and 96; Wisconsin, 45 and 155. In illustration of the relation of these figures to each other, it may be observed that if the crop in Wisconsin last year had been equal to the previous one—that is, 100—this year's product being what it is, and now represented by 155, would have been a fraction short of 70. High figures mean a large increase over the previous crop; but if, for instance, the product for 1875 was but a fourth of an average crop, 200 for 1876 would only indicate half a crop. West of the Mississippi, the crop, except in Minnesota, 109, was much less than in 1875, the figures being, in Missouri, 237 and 93; Kansas, 206 and 72; Nebraska, 544 and 78. The product in Kentucky was 2 per cent. greater than last year, and in Oregon 5 per cent. In all the remaining States it fell below.

SORGHUM.

Returns show an increase of about 14 per cent. over last year's comparatively large crop. The States indicating the highest relative increase are, Georgia, 38 per cent.; Virginia, 37; Kentucky, 32; Texas, 27; Alabama, 19; Tennessee, 14. The only States reporting a product less than last year are, Iowa, 11 per cent.; Maryland and Nebraska, 7; Kansas, 5. Certain counties report a remarkable percentage of increase: in Virginia, Page, 300 per cent.; Madison, 100; Georgia, Shelby, 300; Meriwether, 200; Alabama, Clarke, and Crenshaw, 100; Mississippi, Lincoln, 100; Texas, Rusk, 400; Titus, 200; Arkansas, Ashley, 100; Sharp, 80; Williamson in Tennessee, Taylor in Kentucky, Henry in Ohio, and White in Illinois, 100 each; Clay in Missouri, 200. Good quality is generally reported. Great improvement in the quality of the sirup, resulting from the introduction of improved machinery and methods of evaporating, is specified in different localities. The return from Gwinnett, Georgia, states that the sirup of a large and valuable crop

"equals the best New Orleans;" and from Gibson, Tennessee, that New Orleans sirup has been almost supplanted by the abundance, excellence, and cheapness of sorghum sirup—the price being only 25 cents per gallon. The return from Braxton, West Virginia, also makes special reference to the good quality of the sirup. In Fulton, Arkansas, while other varieties of sorghum were fine, rust injured the "black-top" 20 per cent. In Tennessee, McMinn reports the largest yield, and Blount the largest product ever known; but in the latter the increase is from increased acreage, "as the yield is less per acre than when first introduced." From Ohio, there are some complaints that, while the juice is abundant, it is inferior in quality, lacking in sweetness.

TOBACCO.

The tobacco counties reporting the comparative product make returns not quite so favorable in the aggregate as those of last year. A decrease of product is indicated in Massachusetts, Connecticut, New York, Maryland, Virginia, North Carolina, and Tennessee. An increase is indicated in Pennsylvania, Ohio, Indiana, and Illinois. Kentucky reports about the same as last year.

In Ohio, Indiana, and Illinois, the increase in product is extraordinary. In Ohio, Montgomery reports the best and finest crop of seed-leaf tobacco ever produced; Monroe, that the quality was depreciated by excessively wet weather. In Illinois, the season was very propitious for maturing and curing in Saline; in Johnson, the crop was eaten by worms, the ravages of which were worse than for years. Vernon, Missouri, also had more tobacco-worms than ever before; but other returns from Missouri are favorable in respect to both yield and quality.

The quality of the entire crop averages about the same as that of last year. The depreciation is not noticeable in Connecticut, Virginia, and North Carolina. The average quality is superior to that of the previous crop in New Hampshire, Massachusetts, Pennsylvania, Kentucky, Indiana, Missouri, Ohio, and Tennessee. In Maryland, the quality is reported coarse and dark in Charles; inferior in Calvert, owing to bad weather for curing. In Virginia, the quality is indifferent in Powhatan and in Madison, except that the smaller part, cut before the September storms, is good; very inferior in Mecklenburgh; much damaged by worms and disfigured by the September gale in Dinwiddie; damaged by early frost in Henry, and by a bad season for tobacco in Fluvanna; in Prince Edward, the later plants were green when cut, but the larger portion matured well, and was harvested in good condition; the season was unusually favorable for harvesting and curing in Botetourt; a crop of fine quality was well housed in Carroll, and a full crop well cured in Montgomery. The reported causes of deterioration in North Carolina are worms, early frosts, and the cutting of late crops before maturity in order to avoid frosts. In Tennessee and West Virginia, only slight deterioration is reported from early frosts and the cutting of late crops prematurely to avoid frost. In Kentucky, Daviess returns the largest crop ever grown, except that of 1872. The estimate for product is 10,000,000 pounds, of which not over 2 per cent. was injured by frost; but perhaps 10 per cent. was not well cured, being cut rather too green; in Fleming, a very fine crop, of fair quality, has been housed; in Metcalfe, not more than half a crop, but of excellent quality; in Harrison, the crop has been damaged in the barns.

FLAXSEED.

Incomplete returns from Ohio indicate a product equal to that of last year; Indiana, 1 per cent. less; Illinois, (having an extraordinary crop last year,) 15 per cent. less. These three States represent over three-fourths of the entire crop. Among other States in which the production is of any account, Iowa alone indicates an increase over last year New York, 1 per cent. less. Scattering returns from the States west of the Mississippi indicate that the production of flax is extending. In Missouri, less than half of the counties making returns for this crop reported any for the census of 1870; in Kansas, only 4 out of 17; and in Nebraska, only 1 out of 10.

FRUIT.

APPLES.—Almost the only complaint about the apple crop is that its superabundance has greatly diminished its market value. Maine returns a yield 20 per cent. below that of the previous crop, the causes being previous injury to the trees by caterpillars, depredations by them this season, and, in the southwest part of the State, too dry weather for the maturing of the crop. Vermont falls 4 per cent. below, ascribed to the effects of the severe winter. Drought and September storms reduced the figures in New Jersey to 95, in Delaware to 55, and in Virginia to 92. Missouri reports a production falling 28 per cent. below that of 1875. Severe spring-frosts, canker-worms, coddling-moths, an insect allied to chinch-bugs, hail-storms, and, chiefly, premature falling-off from causes not explained, are the principal sources of reduction. With these exceptions, in the entire section north of the 36th parallel, and east of the Pacific slope, the yield exceeds that of last year; the average excess for the whole area being not less than 17 per cent. The excess in New York is 22 per cent.; Pennsylvania, 23; Ohio, 41; Michigan, 24; Indiana, 39; Illinois, 16; Wisconsin, 54; Iowa, 43; New Hampshire, 63. The coddling-moth was destructive to the crop in Utah. In California and Oregon, the product was slightly less than last year. In the Southern States, in which the crop is of less account, the general yield is considerably below that of last year, owing mainly to drought. South Carolina alone comes up to 100. With rare local exceptions, the quality is reported as superior; the fruit being comparatively large, fair, and free from worms.

The following statements, selected and condensed from notes of our reporters, are given as indicating the general drift in respect to yield, quality, and prices: In New York, Albany returns a good crop, very low in price; Otsego, a very abundant crop, lower in price than for years; Genesee, so abundant that the best winter-apples sell for \$1 per barrel; Sullivan, so abundant that many will be left ungathered; Monroe, the largest crop ever known; Onondaga, very abundant and fine; in Allegany, the best sell on the trees at 15 cents per bushel, and many may be had without money and without price. In Pennsylvania, Clearfield, Mifflin, Tioga, Westmoreland, and Armstrong report abundant crops of very fine quality; in Mifflin, winter-apples sell at 15 cents per bushel; in Bucks, the September gale blew 75 per cent. of the fruit from the trees. The same gale destroyed two-thirds of the crop in Kent, Delaware, and did immense damage to it in Cecil, Maryland; Baltimore County reports a large crop, but, contrary to the general tenor, of inferior quality. In Virginia, the statements respecting quality are uniformly favorable, ranging from good to very fine. In portions of Ten-

nessee, the crop was extra fine; but in McMinn nearly all fell off before ripening, from the combined effects of drought and insects.

In Kentucky, Anderson, Fleming, and Henry report the largest and best crop ever known; in the last named, the yield was so great as to almost annihilate the market-price. In Ohio, Butler returns a larger crop than has been known for forty years, and that of fine quality, free from all the usual defects; Geauga and Meigs, apples a drug in the market; Hancock, so superabundant that thousands of bushels are left to rot on the ground; Perry, an enormous crop, of excellent quality; Miami and Franklin, the largest crops for 20 years, also of excellent quality; Preble, the largest crop ever known, making a demand for cider-barrels which outruns the supply; in Trumbull, cider sells at 5 to 8 cents per gallon. In Michigan, Oakland saved in good condition the largest crop ever known; Wayne, a crop never exceeded in yield or quality. In Indiana, Ripley and Howard have the largest and best-matured crops ever harvested; in Kosciusko, winter-apples, well handled, sell in market at 25 to 40 cents per bushel; in Noble, the best varieties of winter-apples sell for 25 cents per bushel; in Floyd, large quantities are being manufactured into cider, vinegar, and brandy. In Illinois, Boone and Carroll, the crop was so abundant that apples are worth but little in market, and are being mostly manufactured into cider; Hamilton reports winter-apples as knotty and imperfect; and Johnson, that apples rotted on the trees, worse than for many years.

The return from Walworth, Wisconsin, reports that the crop is so abundant as to be fed to hogs—an unprecedented thing in that State; La Fayette had much the finest crop ever raised there; Columbia, an abundant crop, quite free from worms. Decatur and Henry, Iowa, had the largest crop ever grown. In Placer, California, the product surpasses that of any crop for many years. In Frémont, Colorado, the trees were well loaded; but, long before the fruit was ripe, the grasshoppers stripped them entirely of foliage.

PEARS.—The pear-crop falls below the small crop of 1875. The extensive prevalence of the tree-disease known as pear-blight appears to be the leading cause of this diminution. Its prevalence and effect in reducing the crop to a greater or less extent are noted in New York, New Jersey, Pennsylvania, Georgia, Louisiana, Texas, West Virginia, Illinois, and Iowa. The only States in which the product does not fall below that of last year are New Hampshire, 103; Vermont, 100; Wisconsin, 119; Iowa, 105; Oregon, 101; no one of which produces a large crop. In the remaining States, the decline is about 20 per cent. Very few counties report full crops; but in Howard, Indiana, pears are plenty and fine; Decatur, Iowa, produced the largest crop ever known; and Placer, California, a crop surpassing any other for many years.

GRAPES.—The returns indicate a product somewhat less than in 1875. The small crop in New England averaged better than last year. Pennsylvania returns 103, but in the other States north of the Potomac the falling-off averages about 12 per cent. There appears to be a reduction from last year in the Southern States, averaging about 10 per cent. In the interior east of the Mississippi, the product is less than in 1875; the greatest reduction, 19 per cent., being in Illinois. West of the Mississippi, Arkansas reports a falling-off of 32 per cent., Missouri of 15. In California, the product is reported two per cent. larger than last year.

Except in localities where the yield was reduced by the effects of the hard winter or late spring frosts, the almost exclusive cause of reduction has been a widespread tendency to mildew and rot. But in Bucks, Pennsylvania, a good crop was largely injured by bees and wasps; in

Oecil, Maryland, immensely damaged by the storm of September 17; and in Clay, Missouri, the yield was diminished by injuries to the vines by grasshoppers the previous season. Sonoma, California, reports that the abundance of the crop reduces the price so low as to leave no margin for profit; native varieties of fine wine-grapes selling at \$8 to \$10, and foreign varieties at \$12, per ton; choice table-grapes at $1\frac{1}{2}$ cents per pound, and very choice, packed with extra care for the eastern market, at 2 cents.

WINTER-WHEAT.

ACREAGE.—Our December returns indicate that the acreage in winter-wheat has been increased about 5 per cent. over that of the previous year. The small area sown in the New England States is fully maintained, and some additions were expected to be made after our returns were sent in, as in some counties it is customary to delay sowing this grain till just before freezing. All of the Middle States return an acreage equal to that of last year, except New York, which loses 8 per cent. The South Atlantic coast States report a considerable increase, a small deficiency in Georgia being overcome by a marked increase in North Carolina and South Carolina. In the Gulf States, Alabama and Mississippi report an increase which overbalances the decline in Texas. Florida and Louisiana grow but insignificant crops. The inland Southern States all report an increased acreage. North of the Ohio River, Michigan and Wisconsin report a decrease of wheat-acreage, but the other States report increased breadths, enlarging the acreage of this section about 3 per cent. West of the Mississippi River, Missouri enlarges her acreage at least a third, Kansas one-eighth, and Nebraska nearly a half. The Pacific States also report a large increase.

CONDITION.—The condition of the crop appears from the returns to be about 10 per cent. above average on the whole. The Atlantic slope, from Maryland northward, enjoyed very favorable conditions of seeding and growth, though the Hessian fly has done considerable damage in several counties of Pennsylvania, especially in early-sown wheat. Later-sown crops give greater satisfaction. With the exception of South Carolina, the South Atlantic and the Gulf States are below average. Drought retarded both the sowing and the growth of the crop in many counties, while in others the fear of Hessian flies and grasshoppers caused the sowing to be delayed as long as possible. Injuries by grasshoppers are reported in several counties of Texas. A depressed condition is also noted in Arkansas and Tennessee, the latter being 10 per cent. below average. Grasshoppers are complained of in a few cases, but drought was a more general cause of disaster. West Virginia and Kentucky show a superior condition, though seeding was somewhat late on account of drought. All the States north of the Ohio River report a superior condition, especially Ohio and Indiana, which enjoyed remarkably fine conditions for seeding and growth. The Hessian fly appeared in a few very early sowings, but its ravages were comparatively harmless. In several localities of Illinois and Wisconsin, the wheat appears to be better rooted than usual and better prepared to resist the trying fluctuations of winter in those States. West of the Mississippi River, Minnesota and Iowa report a condition slightly above average, while the other States of this region are considerably deficient. Grasshoppers were very destructive at many points, necessitating a resowing of the crop. Wheat sown late to avoid this pest has started very imperfectly. In California, good rains during October facilitated plowing and wheat-seeding, causing a considerable enlargement of acre-

age, but in several counties the moisture has not been sufficient to bring out the crop. Oregon reports a very promising crop. From Dakota come reports of grasshopper damages. In the Choctaw Nation, Indian Territory, the crop is reported as very satisfactory.

WINTER-RYE.

ACREAGE.—The acreage in winter-rye in 1876 does not materially differ from that of 1875. A small increase is shown in New England and in the States north of the Ohio River, which about counterbalances the decline in the other sections; the Pacific States reporting no appreciable change.

CONDITION.—The condition of the crop, on the whole, is about average. A superior condition appears in the Middle States, South Atlantic States, in the States north of the Ohio River, and on the Pacific slope, while in the other sections there is a deficiency. In some portions of the country, the crop was seeded late on account of unfavorable weather; but generally it was placed in the ground in good order, and gained a good growth before winter set in. In the regions visited by the grasshoppers, the sowing of this crop, as in the case of wheat, was delayed, and early-sown crops more or less damaged by these insects, some being entirely destroyed. Reports of such injuries come mostly from the trans-Mississippi region.

Table showing the condition of the crops, &c., on the 1st day of November, 1876—Continued.

States.	BEANS.	PEAS.	BUCK- WHEAT.	FLAX.	COTTON.	SOR- GHUM.	SUGAR-CANE, (not sorghum.)	GRAPES.	APPLES.	PEARS.
	Product com- pared with last year.	Product com- pared with last year.	Product com- pared with last year.	Product com- pared with last year.	Indicated pro- duct com- pared with last year.	Indicated pro- duct (lint) per acre, in pounds.	Product com- pared with last year.	Product com- pared with an average crop.	Product com- pared with an average crop.	Product com- pared with an average crop.
Maine.....	95	95	96					92	80	88
New Hampshire.....	95	94	91					99	103	103
Vermont.....	101	100	94					100	96	100
Massachusetts.....	93		100					105	115	96
Rhode Island.....	63							105	115	92
Connecticut.....	88		100					100	130	96
New York.....	88	93	66	39				96	122	75
New Jersey.....	77							81	95	81
Pennsylvania.....	92	95	77	88				103	123	85
Delaware.....	100	100	80					87	55	75
Maryland.....	94	99	81					94	101	89
Virginia.....	91	100	93	100	99	175		100	92	75
North Carolina.....	103	96		69	92	144		94	101	89
South Carolina.....	97	87			90	149		103	102	77
Georgia.....	96	93			110	151		101	102	63
Florida.....	105	84			100	97		87	76	69
Alabama.....	95				77	125		91	72	32
Mississippi.....	90	70	71		78	167		90	79	58
Louisiana.....	100	73			83	198		89	44	34
Texas.....	98	105	108		100	212		75	58	34
Arkansas.....	105	90			74	193		102	82	77
Tennessee.....	97	99	88	93	101	152		63	65	60
West Virginia.....	96	102	98	89				89	96	61
Kentucky.....	98	103	103					94	101	88
Ohio.....	93	96	100	100				101	109	68
Michigan.....	89	98	88					96	141	81
Indiana.....	98	92	92	99				107	124	92
Illinois.....	96	99	96	85				101	139	97
Wisconsin.....	110	94	155					81	116	81
Minnesota.....	86	138	109	66				91	154	119
Iowa.....	83	87	107					98	120	
Missouri.....	93	93	81	101	96	922		104	143	105
Kansas.....	73	79	96	96				85	72	60
Nebraska.....	74	100	78	80				103	116	80
California.....	102	105	88					131	133	80
Oregon.....	122	99	105	121				102	97	96
								105	94	101

IS PRODUCTION DECLINING?

Agricultural speakers and writers often give the impression, without positive assertion, that we produce less in proportion to population than formerly. If this is so, we eat less than formerly, for we export more. But no intelligent person, after due deliberation, will assert that we feed less to farm-animals or live less generously ourselves than our fathers fed and fared. A statistical answer in the negative has been made by the Statistician of this Department, in an address delivered before the Agricultural Congress at its last session in Philadelphia, as follows:

There are problems presented daily which only agricultural statistics can solve, and upon which largely depends the future prosperity of the farming interest. We cannot here enumerate them, but a reference to one or two may suffice. The inquiry has been often made of late, Is production declining? It has been assumed that we produce in proportion to population less of the great staples of production than formerly. It is the province of agricultural statistics to decide the question. The census alone cannot determine it. Such is the fluctuation in rate of yield, that the supply of a given staple may be actually increasing, while the product of the census-year may be less than in its predecessor ten years before. For instance, corn for 1869 was returned 760,944,549 bushels, and in 1859 the figures were 833,792,742. It has often been asserted, on the strength of these returns, that corn-production was declining, not only *per capita*, but in absolute comparison of quantity. Is it so? The year 1869 witnessed what in country parlance is called "a failure" of the corn-crop. It is plainly folly to take such a crop for comparison. And this fact illustrates the absolute necessity of annual estimates to supplement decennial returns. Since 1869 there have been six harvests exclusive of the present one. Of these six, the largest and smallest stand in juxtaposition: the one in 1875, the largest ever made, is 1,321,090,000 bushels; and the other, another failure, in 1874, 850,000,000 bushels. The increase in a single year is 56 per cent. In 1870 and 1872 the product was nearly 1,100,000,000; the average of annual estimates, for the six years since the census, 1,047,000,000 bushels; and this confirms the opinion, founded on careful study of the history of cropping in 1869, that it was scarcely more than three-fourths of a full crop. Now, let us examine a period of twenty-six years. We find that the yield *per capita* in 1849 was 25.5 bushels; in 1859, 26.6 bushels; and in 1869, the year of a three-fourths crop, 19.7 bushels—the same result as that deduced from the period since that census. If we take the year 1875, the result is excessive, 30 bushels *per capita*, but include it in the period of six years past, and we have 25.5—precisely the supply of 1849.

As to wheat, a general deduction from comparison of census exhibits is less erroneous. The increase in round numbers was from 100,000,000 to 173,000,000, and again in 1869 to 287,000,000. Now, the latter was a large crop, yet the average for the six subsequent crops is 266,000,000, while the estimate for the last year of the six was 292,000,000. Distributed according to population, there were 4.3 bushels per head in 1849, 5.5 in 1859, 7.46 in 1869, and for the period since 6.6 bushels. This shows an increase of more than 50 per cent. in the proportion of supply in twenty-six years, and is exactly in accordance with the history of the several crop-years, and is a proof of the substantial correctness of these estimates.

The export figures illustrate further the fact of the large increase of wheat-production. The total export of wheat and flour in fifty years is equivalent to 1,052,090,000 bushels of wheat, of which 91,000,000 were shipped during a single year, 1874. The exports of one-half of this period up to 1850 were only 178,000,000—less than twice those of 1874. The heavy increase during recent years is especially noteworthy, nearly half this semi-centennial aggregate having been shipped in ten years. While our population has nearly doubled since 1849, the quantity of all cereals taken together has more than doubled. The census reported 867,000,000 bushels. Allowing something for incompleteness of that enumeration, the 2,000,000,000 bushels produced in 1875 allow a distribution of 46 bushels to each inhabitant, in place of 37.4 census-bushels, or possibly 40, with a complete enumeration. Our average supply since the last census exceeds 40 bushels; and thus is demonstrated the remarkable fact that, with our rapid increase in numbers, perhaps without a parallel, we not only keep up our high standard of cereal production, but actually advance it. This is owing to our vast areas in instant readiness for the plow, to our advance in variety and perfection of agricultural machinery, and to the stimulus of a foreign demand, which has never been so pressing as during the last ten years. It is possible to double our present population without diminishing this high rate of supply. There is more danger at present of overproduction and unremunerative prices than of scarcity. The proportion engaged in agriculture in the West is still too large, and far too large in the South;

and the withdrawal of workers from rural to other industrial arts would not only greatly facilitate the creation of wealth, but would stimulate invention, labor-saving skill, and industry in agriculture.

Having reached the conclusion that corn-production is not declining, and that the supply of wheat has increased 50 per cent., what can we say as to the meat-supply and the numbers of horses? As to the latter, it is not found, according to the fears of too conservative farmers of a former generation, that multiplying railroads tends to diminish the use of horses. More horses are now used in taking people to the train than were formerly required to perform the whole journey. The census reports only the horses of the farm, without reference to those of the town or city; but, for comparison, taking the numbers in proportion to population, there were nearly twenty to each one hundred people in 1850, quite twenty in 1860, and, notwithstanding the waste of the war, eighteen in 1870. The increase since has at least equaled the advance in population. Coming to cattle, while we know that the numbers in the census are too low, especially for Texas, California, and the Territories, we may use them for comparative purposes. From 1850 to 1860, we find the number of all kinds of cattle slightly increasing from 77 to 81 to each hundred of the population, and then witness a decline to 62 in 1870. Since that date the numbers have increased, but not materially faster than the population. The consumption in the war was a prominent cause of the decline, and a growing preference to horses as a substitute for working-oxen tended to further reduction. The supply of sheep *per capita* was somewhat greater in 1870 than in 1860, the ratio rising from 70 to 73, but less than in 1850, when there were 93 per hundred of population. But the most marked decline in supply has been in swine; the figures in these decennial periods being respectively 129, 105, and 65. The tendency is to still further decline in some of the principal swine-districts.

There is another statistical point of especial interest in this connection. While numbers have declined in proportion to population, the value of all farm-animals divided among the population would give about \$24 per head in 1850, \$34 in 1860, and \$44 in 1870. Not only has scarcity increased the value, but improvement in breeds has added size and weight, so that with smaller relative numbers we are able to feed our people and ship more beef and pork and lard than ever. Here is food for reflection. Here is the cause of advancing prices of beef and pork. And it is fortunate that increase in meat-production is consonant with a higher and more intensive agriculture; that it is, in fact, one of the essential conditions of such improvement. And if we can act upon the suggestion of Mr. Harris, in his address last evening, and perfect breeds of meat-producers that shall be able to assimilate a larger proportion of the fat-and-meat producing elements contained in the food supplied, we shall hasten the adoption of a system of agriculture that shall be restorative and not exhaustive.

We thus learn from statistics that grain-growing exclusively, though remunerative as a temporary expedient, is a speculation, and not true farming. Land in the prairies worth \$50 per acre is bought for \$5, and its true value is discounted in installments; i. e., the soil is plundered piecemeal, and converted into wheat and cash to furnish means for fencing and house-building, and to supply capital to the pioneer farmer. In this point of view, it has been remunerative as a pioneer expedient; but, with a farm equipped for the work of a long future, the superior profit of a restorative system, in which domestic animals fill an important part, cannot be questioned, either in the deep prairies of Illinois or the rich bottoms of the Missouri Valley.

CHEMICAL MEMORANDA.

By WILLIAM MCMURTRIE, CHEMIST.

BAT GUANO.—In addition to the samples of this important product sent to the Department by J. A. V. Pue, Bandera, Texas, this gentleman has forwarded another sample from a different cave, which our analysis has proved to be of greater value than any we have yet analyzed. There are, doubtless, very many deposits of great extent, of which we have been unable to obtain any knowledge, that will be as valuable as that represented by this sample. This one, like others of high grade, contained broken scales of insects, and is in excellent condition for direct application to the soil.

The results of our analysis are as follows:

Moisture.....	9.12
Ash, by charring and ignition.....	38.00
Total phosphoric acid.....	6.09
Potash.....	0.47
Organic nitrogen, equivalent to 11.15 per cent. potential ammonia.....	9.18
Nitric acid.....	1.69
Actual ammonia.....	1.18

These figures undoubtedly place the material on a par with many of the concentrated fertilizers found in the markets, and should rouse sufficient interest and attention to secure for it an extensive application in southern agriculture.

AMERICAN TANNING-MATERIALS.—Under this head, I propose to submit the results of the analyses of the vegetable substances containing sufficient of tannic acid to make them of value for tanning that were collected and prepared for exhibition in the late International Exhibition in Philadelphia. The list may not comprise all the indigenous products that are of value in this respect, but some of them, at least, have not yet received extended application.

The method employed in our estimations was devised by F. Jean, and published in the "Bulletin de la Société Chimique de Paris," (xxv, 511,) and depends upon the absorption of iodine by tannic acid. By this method, the quantity of tannic acid found in the various samples respectively was as follows:

	Per cent.
Ground sumac, (mixed,) from Winchester, Va.....	24.18
Sumac, (<i>Rhus cotinus</i>), Hallsborough, Va.....	24.08
Sumac, (<i>Rhus glabra</i>), Georgetown, D. C.....	26.1
Leaves of sweet fern, (<i>Comptonia asplenifolia</i>), from near Boston, Mass.....	9.42
Leaves of <i>Polygonum amphibium</i> , from Nebraska.....	11.6
<i>Ephedra antispyphilica</i> , from the table-lands of Arizona and Utah.....	11.9
Bark of sweet-gum, (<i>Liquidambar styraciflua</i>), from District of Columbia.....	8.36
Bark of red-oak, (<i>Quercus rubra</i>), from Canton, Ill.....	5.55
Bark of white oak, (<i>Quercus alba</i>), from Canton, Ill.....	7.85
Crushed quercitron bark, (<i>Quercus nigra</i>), from Winchester, Va.....	6.47
Bark of <i>Quercus coccinea</i> , from Canton, Ill.....	7.78
Bark of <i>Quercus macrocarpa</i> , from Canton, Ill.....	7.85
Bark of hemlock, (<i>Abies canadensis</i>), Van Ettenville, N. Y.....	9.5

AMERICAN WINES.—The collection referred to also contained a series of specimens of American wines, manufactured and contributed by Messrs. Bush & Son & Meissner, of Bushberg, Mo.; and, since the series embraced wines made from nearly all the varieties of grapes employed in the manufacture of wine in this country, the results of their analyses are considered of some interest. The wines, being made by the same parties, are more likely to be subject to similar conditions in the process, and comparison between them is therefore more reliable.

Name of brand.	Year of vintage.	Composition of wine.				
		Specific gravity.	Alcohol, by volume.	Alcohol, by weight.	Acid,* per cent.	Solids, per cent.
1. American sherry.....	.....	.....	17.0	14.23	0.37	6.55
2. Norton's Virginia Seedling.....	.....	0.995	12.2	9.85	0.66	2.31
3. Hermann.....	.....	0.990	13.9	11.24	0.48	.....
4. Alvey.....	1873	.....	10.1	8.13	0.78	2.52
5. Taylor Bullet.....	1874	0.995	12.4	10.01	0.48	1.73
6. American port.....	.....	1.03	13.1	10.59	0.48	11.30
7. Martha.....	1873	0.995	11.3	9.11	0.43	1.72
8. Missouri claret.....	1874	0.9975	11.8	9.51	0.72	2.37
9. Herbmont.....	1874	0.995	11.8	9.51	0.57	2.42
10. Catawba.....	1874	0.990	12.0	9.69	0.37	1.66
11. Catawba.....	1875	0.995	11.0	8.87	.....	1.53
12. Catawba, sweet.....	1875	1.015	14.4	11.65	0.40	7.86
13. North Carolina Seedling.....	1874	0.990	13.5	10.92	0.48	1.60
14. Cynthia.....	1874	0.995	12.8	10.33	0.54	3.15
15. Goethe.....	1873	0.990	11.8	9.51	0.42	1.68
16. Clinton.....	1874	0.998	13.4	10.83	0.45	3.70
17. Delaware.....	1874	0.990	13.1	10.59	0.40	2.18
18. Ives Seedling.....	1874	0.995	11.2	9.03	0.54	2.29
19. Norton's Virginia.....	1873	0.995	12.6	10.17	0.47	2.46
20. Concord.....	1873	1.000	9.4	7.56	0.60	2.38
21. Concord.....	1875	0.9975	8.7	6.99	0.48	2.36
22. Concord, white.....	1874	0.995	12.2	9.85	0.47	1.55

Calculated as dry tartaric.

FIXATION OF NITROGEN BY THE INFLUENCE OF ATMOSPHERIC ELECTRICITY.—It has for a long time been well known that plants contain more nitrogen than can possibly be supplied by the ordinary constituents of the soil, together with the amount carried down by rain in the form of nitric acid and ammonia. This difference is undoubtedly due to the utilization of atmospheric nitrogen; but the manner in which this is brought about has not heretofore been satisfactorily explained. Johnson, Armsby, and others have made valuable contributions to our knowledge of this phenomenon in the results of their investigations into the absorption of nitrogen by non-nitrogenous organic matter in presence of alkalis. But a more satisfactory explanation will be found in the results of the late investigations of M. Berthelot. In papers presented to the Academy of Sciences of Paris, he has shown that nitrogen is directly absorbed at ordinary temperatures by organic matters under the influence of the electric current, and that this absorption may take place either with pure dry nitrogen and the hydrocarbons, in which case oxygen is completely excluded, or with moist woody principles and dextrine. It operates equally well with pure nitrogen and atmospheric nitrogen. The electric currents were developed by means of enormous tensions and with a large Ruhmkorff coil, that is, under conditions comparable to the electrical tension during thunder-storms. The application of the results to vegetation are therefore legitimate, but only for these exceptional conditions. The question then arose whether this absorption of nitrogen will not also take place under the influence of much more feeble electrical tensions, such as are continually produced in the atmosphere. Experiments instituted for the examination of this question gave affirmative results.

The apparatus employed for this purpose by M. Berthelot consists of two very light glass tubes, one placed within the other, and both hermetically sealed. In the inner tube was placed a piece of silver or platinum foil, rolled in cylindrical form and placed against the sides to act as an armature. To one end of this foil was attached a piece of platinum wire, which was soldered in both the inner and the outer tube. This wire communicates with a conductor electrified by the atmosphere,

in order to establish between this internal armature and a certain atmospheric stratum an electrical equilibrium. On the other hand, a piece of tin foil rolled about the external tube in contact with the air communicates with the soil. An interval of glass separates the tin foil and the platinum wire, and this interval is carefully coated with a triple layer of gum lac, in order to prevent any hygrometric loss and all communication between the two armatures.

In the annular space which separates the two tubes are placed strips of filter-paper, or two or three drops of a sirupy solution of dextrine, and pure nitrogen, or even ordinary air, subsequently introduced. The introduction of the gas and the different material is effected by means of a gas-tube soldered to the extremities of the apparatus, which are afterward carefully closed with the lamp. This always precedes placing the armature of tin and the varnish of gum lac.

Between the two armatures is established an electrical tension equal to that between the soil and a stratum of air two meters above it, the amount being deduced from the daily observations of atmospheric electricity made with a Thompson Branly electrometer at the meteorological station at Montsouris. With this electrical tension established, twelve tubes of the kind described containing respectively moist paper and moist dextrine, some of them being supplied with pure nitrogen, some of them with atmospheric air, all being hermetically sealed except two, which were so arranged that a current of air could pass through them and over their contents; all were allowed to remain undisturbed for two months, and at the end of this time the material was found to have absorbed nitrogen, forming compounds which were decomposed by soda-lime at 300° to 400° C., with formation of ammonia. The amount of material employed in each of the tubes was less than one gram, while the amount of nitrogen taken up was valued at one or more milligrams. It will thus appear that the quantity of nitrogen that may be fixed upon a surface covered with organic matter becomes considerable from electrical influences without taking into account other influences so well known.

In two of the tubes, Berthelot noticed the formation of green spots, due to microscopic algae, arising probably from germs introduced with the material. In these tubes, more nitrogen was fixed than in any of the others. In one of the tubes supplied with pure nitrogen, the gas acquired a fetid odor. In the conclusion of his paper, Berthelot says:

These experiments explain the influence of a natural cause upon vegetation, which has been quite considerable, but which has until now been almost unsuspected. Heretofore the study of atmospheric electricity in its relation to agriculture has been with reference to luminous and violent manifestations only, such as thunder and lightning. In all hypotheses, only the formation of nitric and nitrous acids and nitrate of ammonia has been considered. Further than this, no doctrine relative to the influence of atmospheric electricity has yet been presented. Now, in my experiments, it has been a question of a totally new and absolutely unknown action, which takes place continually under a clear sky, determining a direct fixation of atmospheric nitrogen within the proximate principles of vegetable tissues. In the study of the natural causes capable of affecting the fertility of soils, and of acting upon vegetation, causes which we endeavor to determine by meteorological observations, we should hereafter take into account not only differences in the action of light and heat, but also the electrical state of the atmosphere.

NEW FEVER CURE—*Croton adenaster*.—In a late number of the "El Oberrado Médico de Méjico" is described a plant of the family of *Euphorbiaceæ*, called *picosa* or *echiladera*, (*Croton adenaster*.) which, on account of its febrifugic properties, has become a rival of the cinchonas. According to the analysis of Dr. L. M. Imenez, it contains an acid, a soft greenish resin having an acid reaction, a yellow oleo-resinous

coloring matter, a volatile balsamic substance, and certain salts. The greater part of the valuable constituents are extracted by dilute alcohol.

FORMATION OF CARBO-HYDRATES IN PLANTS.—An important contribution to our knowledge of the formation of the carbo-hydrates in plants has lately been made by Herr A. Stutzer, of Göttingen, in a paper presented to the Chemische Gesellschaft zu Berlin.

The views held by leading authorities on the subject vary so materially that the author was led to make a series of culture-experiments in order to test them. Liebig and Rochleder hold that the organic acids (oxalic, tartaric, &c.) form the transition-links between atmospheric carbonic acid and the carbo-hydrates; while other authorities, such as Davy, Sachs, &c., hold totally different views, believing that they are formed directly without intermediate steps. For testing the views of Liebig, he experimented with young plants of *Brassica rapa*, which are distinguished for their moderate weight and rapid growth. For atmospheric carbonic acid were substituted oxalic and tartaric acids, their calcium compounds being found more favorable to the purpose. A formation of new leaves and an increase of weight of dry substance showed that these organic acids may, to a certain extent at least, take the place of carbonic acid in plant-nutrition. He further observed a decided exhalation of oxygen from water-plants, in direct sunlight, which had received very dilute solutions of oxalic or tartaric acid salts instead of carbonic acid.

He next endeavored to determine in what manner this change of the two acids into cellulose and carbo-hydrates takes place. He considers it possible by two ways: by gradual liberation of oxygen, a reduction taking place, as Liebig believed; or they may be first oxidized to carbonic acid, and from this condition further changed in presence of sunlight in the green leaves. To determine which of these metamorphoses takes place, the plants are inclosed in an atmosphere completely freed from carbonic acid. If, under such conditions, a reduction takes place, the plant can vegetate; but this is impossible if the acids must first change to carbonic acid by oxidation. Experiments in which the conditions thus described were observed showed that oxalic acid cannot be assimilated, that the plants rapidly diminish in weight and die. This proves Liebig's theory to be incorrect, and that oxalic acid cannot be the transformation-link between atmospheric carbonic acid and the carbo-hydrates, and, consequently, it can enter into the process of nutrition only after previous oxidation to carbonic acid. This being established for oxalic acid, it will also hold good for the carboxyl group, oxalic acid being a $\text{CO} \cdot \text{OH}$ compound.

With tartaric acid and an atmosphere free from carbonic acid, very different results are obtained. The plants vegetate, though much more slowly than with admission of carbonic acid, the increase being only about one-half as great. This shows that, with tartaric acid, the alcohol groups may be changed directly into the formative material of the plant. This being accepted, the same law will hold good for the alcohol groups which have no analogous acids. This was clearly proven by growing plants with exclusion of atmospheric carbonic acid, and with glycerine as the source of carbonaceous matter.

It therefore appears that in presence of light the carboxyl group may, after previous oxidation, indirectly, while the alcohol groups may directly, enter into the formation of material in green plants.

Experiments made with plants under similar conditions to deter-

mine whether the methyl or methylen group may change to the final products, showed a formation of new leaves, and an increase of solid substance; but, since oxygen must first be taken up, these groups are subject to extensive metamorphoses.

ALCOHOL IN PLANTS.—Herr Gutzeit, as the result of an extended series of experiments, has determined the presence of ethyl alcohol (alcohol of wine) in the unfermented juices of the green parts of plants, especially in *Heracleum giganteum*, (cow-parsnip,) *Pastinica sativa*, (common parsnip,) and *Anthriscus cerefolium*. He succeeded in separating a small quantity of volatile fluid, which he found to consist of one-third methyl alcohol and two-thirds ethyl alcohol. From examination of fruits in various stages of growth, he concludes that, as the process of ripening advances, the ethyl alcohol changes to other compounds, while the methyl alcohol remains constant.

GERMINATION OF SEEDS IN NITROUS OXIDE.—Notwithstanding the fact that Borsezow has found that nitrous oxide may replace oxygen in the respiration, Cassa's experiments show that wheat and corn cannot germinate in an atmosphere of the pure gas, and he has instituted experiments to determine what percentage may exist in atmospheric air without preventing germination.

INFLUENCE OF PLANT-SECRECTIONS UPON PUTREFACTION.—Darwin in his "Insectivorous Plants," describes a series of observations showing that the secretions of the glands peculiar to the leaves of sun-dew (*Drosera rotundifolia*) and plants of like character have the power of dissolving nitrogenous organic matter by an action similar to that of the gastric juice of animals, changing it to a condition in which it may be completely assimilated by the plant in its vital economy, and that, like the gastric juice, it has the power of arresting and preventing putrefaction. This power of preventing putrefaction has been found by Dr. Jaennel to be inherent in the roots of growing plants. To determine this fact, he macerated a couple of beans in water, and, having allowed the solution to stand for some time until putrefaction was thoroughly established, he divided the mass into two portions, when he placed in one part the roots of a young haricot shoot, the other being left exposed to the air. In a few days the bacteria were completely removed from the fluid subjected to the influence of the plant, *paramœcia*, smaller infusoria taking their place, while a greenish granular sediment settled to the bottom. Similar results were obtained from the influence of the roots of a bean-plant and the roots of a blade of oats upon 60 grams of putrifying fluid containing 1 gram of flesh. After five days, the solution contained infusoria but no bacteria, although the flesh was in active putrefaction. Dr. Jaennel considers that the arrest of putrefaction is due to the liberation of oxygen, which causes the bacteria to be replaced by infusoria, to the existence of which oxygen is so essential.

INFLUENCE OF BORACIC ACID AND BORATES UPON VEGETATION.—The late experiments of Dumas upon alcoholic fermentation having shown the antiseptic properties of boracic acid and its compounds, M. Eug. Péligot was led to study its influence upon plant-growth. The results of his experiments show that it has a distinctly poisonous action upon vegetation, causing death of the plants within a short time after its application. On account of this action upon plants, he seriously questions the propriety of its application to the preservation of meats to be used for food, since it may exert a similar influence in the animal economy. He says that all meats preserved with borax should be carefully washed before consump-

tion, but doubts whether complete removal can be effected in this way. He therefore recommended to the Academy of Sciences of Paris that a member of the medical section be requested to determine whether this substance, so poisonous to plants, is perfectly harmless to animals. M. Cl. Bernard was requested to perform this duty.

MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

The following communication was addressed to the Commissioner of Agriculture, the 7th of September last, by the editor of the Cultivator and Country Gentleman :

SIR: The very general prevalence of grape mildew and rot, this season, gives increased importance to the questions which have so long perplexed practical grape-growers, viz: What is mildew? how many kinds of it are there? is the rot a distinct disease, or only a form of mildew? how is mildew propagated? what circumstances of soil, climate, or culture tend to favor its propagation? and what means, if any, can be relied on as a preventive of the evil? * * * *

Mr. Taylor, the Microscopist of the Department of Agriculture, performed a number of experiments with the spores of *Oidium Tuckeri* (the fungus of the foreign grape-vine) showing the facility with which they germinated when placed under cover of glass, with the requisite heat and moisture. He has also tested the effects of the fowers of sulphur, the vapors of turpentine, benzine, and carbolic acid, as preventives of the germination of the spores. In these experiments, the sulphur did not seem to have the effect usually ascribed to it, but the other articles entirely prevented the germination, and evidently destroyed the vitality of the spores. This result is a little surprising as regards the sulphur, since this substance has always been relied on as the surest preventive of mildew in graperies. I should be glad if the Microscopist would have the kindness to state whether these experiments have been repeated, or any cause discovered for the seeming anomaly. * * * *

In reply to these inquiries, I would say that mildew is now admitted to be a cryptogamic plant, belonging to a low order of fungi. Some mycologists affirm that there are as many as eighteen species which are injurious to the grape-vine. Two very distinct genera are especially noticeable, the *Erysiphe* and *Peronospora*. The former is principally confined to the foreign grape-vine, and the latter to the native. These two genera include most of the species of fungi which injure the grape-vine. Their modes of fructification, however, are different. In the *Erysiphe*, the germ-cells, which are called sporidia, are produced in cysts. These cysts are known by different names, as sporangia, asci, or thecae. This genus belongs to the *Sporidiifera*, the second of the two grand divisions into which fungi are divided. Sometimes late in the fall, *Erysiphe* appears on the old leaves of the native grape-vine. Another species, quite similar in form, is found on the willow, and known as *Erysiphe adunca*, Schlecht; and still another on the maple, *Erysiphe bicornis*, Link, having eight spores. I have never found *Erysiphe* on the young leaves of the native grape-vine. During the summer of 1871 and of 1872, the foreign vines of the Department graperies were infested by immense numbers of a species of *Erysiphe*. The sporangia had waving appendices, but their terminal points were not hooked. Very dry and warm conditions of the atmosphere are favorable to the growth of the fungus *Erysiphe*, especially when graperies are imperfectly ventilated.

The second genus mentioned, *Peronospora*, belongs to the other grand division of fungi, called *Sporifera*. The spores, which occupy the same position and perform functions similar to the seeds of the higher orders

of phenogamic plants, are naked, that is, produced on spicules, and are not inclosed in cysts. By general consent, the term spore is limited to such germ-cells as are not produced in cysts. *Peronospora* appears to be favored in its growth by excessive moisture, followed by high temperature. Drainage, shelter, and a moderately moist and warm atmosphere are unfavorable to its growth, and consequently favorable to the healthy development of the native grape-vine.

As to whether grape-rot is a distinct disease, or only a form of mildew, mycologists generally believe that mildew of the grape-vine is the direct cause of the leaf-disease, and in some cases may lead to rot of the grape; but grape-rot may also be caused by excessive moisture and imperfectly-drained land.

Mildew is propagated by the spores (seeds) of fungi, which are produced in large numbers, and conveyed in the atmosphere to surrounding objects. The spores vegetate with great rapidity on the objects to which they are attached, and draw their nourishment principally through their mycelium (a form of roots) from the plants on which they grow, although a part is derived from the atmosphere.

Sulphur has generally been relied on as an antidote to mildew, and is commonly supposed to be an antiferment. Whatever its curative properties may be in relation to the grape-vine, sulphur is not an antiferment as chemically considered; and it cannot be classed as either an antiseptic or as a disinfectant, but it may have the power to foster a healthy growth of the living plant to which it is applied.

The following experiment will throw some light on this subject: To a pint of pure water I added half an ounce of the flowers of sulphur, and immersed in the solution two leaves of a foreign grape-vine. The liquid was exposed to a temperature of about 70° Fahrenheit. On the third day, fermentation was in full force. On the sixth, the odor of sulphuretted hydrogen was very strong, bacteria and mycelium of fungi covered the whole surface of the water, and the vine-leaves were decayed. I have frequently tried this experiment, using various kinds of foliage, and have always obtained the same results.

Some of the compounds of sulphur, as sulphurous acid, dilute sulphuric acid, and combinations of sulphur with the alkalis, are of an antifungoid character; but these differ so essentially from the flowers of sulphur in their chemical characters that they cannot necessarily be classed with that substance. Sulphurous acid has a great affinity for oxygen at ordinary temperatures, and is easily decomposed, while pure sulphur remains unchanged when exposed to the air only. When sulphur is boiled with caustic potash, soda, or lime, sulphides are formed, and such compounds are antiferments; but the caustic alkalis mentioned are themselves antiferments, and the addition of sulphur will not render them more so. Sulphur in a soluble condition may be absorbed by plants as food; and, since it is a well-established fact that albumen of both vegetables and animals is never free from sulphur, it may be that the application of sulphur in a soluble state may indirectly destroy fungoid growths by building up the organic structure of the diseased plants, and thus enabling them to resist decay by fermentation, which is generally, if not always, the result of cryptogamic plants growing on them.

The specimens of the French *Phylloxera vastatrix*, alluded to in the following letter, have been compared microscopically with the American *Phylloxera vastatrix*, and well-defined photographs made of both insects. They seem identical. Cuts will be prepared of both for future publication, with such observations as may be made by the entomologists of the countries to whom photographs have been sent.

MARSEILLES, September 26, 1876.

To the Commissioner of Agriculture :

SIR : I have the honor to send you, by post, some specimens of the *Phylloxera vastatrix* and some of the grape-roots which have been attacked by that insect, of the ravages of which, in France particularly, you are well aware. It is alleged, I believe unjustly, that we are indebted to your country for this destructive evil, the *Phylloxera* having been brought to this country in the first importation of American vines. By a comparison of our insects with yours, you can judge whether they are the same species. Please send me some specimens of your *Phylloxera*, and give me the particular habits of the insect.

The habits of ours are as follows :

1. During the summer, the wingless females remain about four months upon the roots.
2. In October, some of the females, after metamorphosis, taking flight from the ground, ascend to the stems of the vines, where they deposit their eggs.
3. The eggs, which are called winter-eggs, are hatched in the spring.

Yours, &c.,

C. JAQUÈME.

AGRICULTURAL EXPERIMENT-STATIONS IN EUROPE.*

BY PROF. W. O. ATWATER.

WORK ON THE STATIONS.

The work of the experiment-stations consists chiefly in investigations and experiments directly or indirectly connected with the nutrition and growth of animals and plants useful in agriculture. Various branches of agricultural technology, and the testing of the quality and value of commercial fertilizers, food-materials, and seeds, are also objects of their labors. The work of some stations is confined to one, while that of others includes several of these branches. From data furnished by Nobbe, in the *Landwirthschaftlichen Versuchs-Stationen* for 1874, it appears that in that year, of the 40 German stations, 13 were engaged in researches in animal physiology ; 20 in vegetable physiology ; (these terms being here understood to include essentially the chemistry of animal and vegetable nutrition ;) 5 were busied chiefly with studies in the chemistry and physics of the soil ; 4 made a specialty of grape-culture and wine-production, and 5 of questions in agricultural technology. Besides the work above mentioned, a control of the trade in fertilizers by analyses of wares bought and sold, was exercised by 28, of that in seeds by 16, and of that in fodder-materials by 13 stations.

Some idea of the nature and scope of the work of the German stations may be obtained from the following accounts of the "scientific and practical labors" of a number of the Prussian stations "for 1874, with plans for 1875," taken from the "Annual report upon agricultural experiment-stations in Prussia, for the year 1874, to the minister of agriculture." The labors, at the stations named, were on the following topics :

HALLE.—1. On the weathering of phosphorites under the influence of the organic substances of the soil.

2. Experiments on the porosity of building-materials.

3. Alterations of nitrogen in the soil.

4. Investigations on moor-culture.

5. Investigations on the manufacture of alcoholic spirits.

6. Investigations on the estimation of the content of starch in potatoes.

A number of manufactories and stores of artificial fertilizers are

* A continuation of an article in the annual report of 1875.

under the control of the station, and 1,600 analyses of these articles and of food-materials were made during the year.

Work planned for 1875.—The experiments 1-5, above, to be continued.

1. Investigations on the periodic increase in dry substance, &c., in the growth of the maize-plant. (Undertaken at the instance of the ministry of agriculture.)

2. Investigations on moor-culture in Holland.

3. On the alteration of the organized substance of nitrogenous fertilizers by fermentation.

WEENDE.—1. Rotten brood of bees, (analyses of materials collected in 1873.)

2. Developments of sugar-beets, (analyses of materials collected the previous year.)

3. Preparation of charts illustrating the more important experiments made at Weende, on the transformation of nutritive material by neat cattle and sheep. Besides this, analyses were made for private individuals of 64 samples of commercial fertilizers, 4 marls, 4 moor-soils, 1 cultivated soil, 5 waters, and 7 fodder-materials.

Work planned for 1875.—1. Experiments on the fattening of sheep of different breeds.

2. Testing the Pettenkofer respiration apparatus.

3. Investigations with sheep on the dependence of the digestion of food upon the proportion, by weight, of coarse fodder on the one hand, and of grains and roots on the other.

4. Experiments on the preservation of milk by use of salicylic acid.

BONN.—A considerable number of analyses were made by fertilizers, seeds, and fodder-materials.

Work planned for 1875.—1. Investigations on the influence of salicylic acid upon the preservation of animal products.

2. Investigations on the composition and value of various materials for tanning.

3. Investigations of marls occurring in the Rhine region.

MÜNSTER.—1. On the liberation of free nitrogen in the decay of nitrogenous organic substances.

2. On the constitution of vegetable fats.

3. On the digestibility of wax.

4. On the chemical composition of human foods.

Analyses were made of 340 samples of fertilizers, 14 marls, 21 fodder-materials, 21 potable waters, 19 technical materials, and 179 samples of seeds.

Work planned for 1875.—Besides repetition, in fuller detail, of the work of 1874:

1. (At the instance of the Prussian ministry of agriculture.) Determination of the increase of dry weight of potatoes and corn in different stages of growth.

2. Determination of the amounts of the individual mineral ingredients which a water used repeatedly for irrigation will yield to the soil.

DAHME.—1. Chemical and microscopical investigations on the consumption and storage of reserve-materials in the potato-tuber.

2. Comparative experiments, in pots and in the field, on the effect of potash in natural kainit and in the manufactured potash salts.

3. Field-experiments with artificial waters.

4. Experiments upon the influence of different ways of cutting seed-potatoes upon the yield.

5. Experiments on the growth of oats and peas in the shade.

6. Experiments on the relation between the water-evaporation and decomposition of carbonic acid by plants.

7. Vegetation experiments, in purified quartz-sand, on the minimum amounts of nutritive materials required by pea-plants.

8. Daily determinations of atmospheric carbonic acid.

In addition to this were conducted numerous analyses in the interest of private individuals, investigations of seeds, observations on diseases of plants, extensive correspondence with agricultural societies, and several lectures.

Work planned for 1875.—Besides prosecution or repetition of 4, 5, 6, 7, and 8, above:

1. Cultivation of peas in aqueous solutions.

2. Experiments on the growth of barley when, both in soils which had and which had not been treated with marl, nitrogen was applied in the form of ammonia and of nitric acid.

3. Determinations of dry substance and nitrogen in maize and red clover at different periods of growth, (undertaken at the instance of the ministry of agriculture.)

4. Experiments with seeds of 20 different cultivated plants to determine the maximum, minimum, and most favorable temperature for germination.

5. Experiments on the growth of the potato-plant after removal of the seed-tuber.

6. Experiments on the retention of ammonia in sheep-dung.

More detailed accounts of some of the classes of experiments referred to above will, perhaps, be in place here.

EXPERIMENTS ON THE NUTRITION OF DOMESTIC ANIMALS.

In conducting the feeding-trials at the German stations, where nearly all of the later experimenting in this line has been done, neat-cattle, sheep, goats, horses, and swine receive different foods in varying proportions and mixtures, and the effects are accurately noted. Among the questions whose solution has been sought are, the chemical composition of different food-materials, and the proportions of food-ingredients in each, as albuminoids, carbohydrates, and fats, which are digested by different animals; the parts which they play in the animal economy; which elements are the "flesh-formers" and which the "fat-formers;" which make the fat, (butter,) and which the casein (curd) of the milk; which produce heat and muscular force, &c.; in what proportions and mixtures the animal will digest most fully and use most economically the food-ingredients; and, finally, what amounts of each will be needed and utilized to the best advantage by different animals and for different purposes.

The care and patience and thoroughness with which these experiments are conducted, the amount of labor and time and money they cost, and the ways that their results are applied, would be quite astonishing to most American farmers. Careful weighings and analyses are made of the food the animals consume, the milk they produce, the excrement and urine they void, and even the air they breathe. A single experiment often requires the hard and unremitting work of several chemists day and night for several weeks or months. "The accounts of the experimental investigations on the subject of animal nutrition that have been published during the last fifteen years in the German language alone would make what most people would call a good-sized library. The experiments thus described are numbered by hundreds and even thou-

sands, each one of which has cost the labor of days, weeks, or months. They have called in requisition the services of the ablest scientific men and the most successful farmers. They have involved an incalculable amount of thought, care, and toil in the laboratory, the stable, and the study. The labor, much of it of a menial sort, has been performed willingly, even enthusiastically, by those to whom it has brought not wealth, but only meager support. Nor has the work been in vain. These investigations have done a vast deal to settle the questions about stock-feeding, which occupy so much space in the papers, and which are as perplexing as they are important to millions of farmers on both sides of the Atlantic. Combined with the results of daily farm experience, they have shown for what purposes different kinds of fodder-materials are best fitted, and how much each is worth. They have taught the farmers how to make valuable fodder out of poor hay and straw; how to employ lucerne, seradella, clover, and other forage-crops to the best advantage; how to utilize waste products such as flax-seed and cotton-seed and the oil-cake made from them, also the refuse from the manufacture of sugar from beets, and of alcoholic spirits and starch from potatoes and grains. They have shown in what proportions these and scores of other fodder-materials should be mixed and used, so as to get the greatest benefit at the least cost." In brief, this sort of work is supplying German farmers with just the information they need in order to keep their stock, and produce meat, dairy-products, and whatever else comes from the maintaining of domestic animals, most rationally and with the largest profit.

EXPERIMENTS IN VEGETABLE NUTRITION.

While a very large part of the whole work of the European stations is devoted to the study of the nutrition of plants, to the ways in which their food is furnished by atmosphere, soils, and fertilizers, and used in their development, yet but comparatively few experiments are made on the growth of crops in the field. Experience has shown that the most reliable and useful results are obtained in the growing of plants in water containing various fertilizing materials in solution, or in artificial soils watered with such solutions. The influences to which the plant is subjected in its growth are thus under more perfect control, and the results, in a corresponding degree, more accurate and complete. "Some of the substantial advantages that have been gained as the immediate outcome of the work of the experiment-stations" are summed up as follows by Professor Johnson:

In respect to the food of plants, it has been settled that potash, lime, magnesia, iron, phosphoric acid, and sulphuric acid must be furnished to all agricultural plants through their roots and by the soil, in order to their growth. It has also been shown that soda, silica, and chlorine are not needful for the early growth of grain-crops, but that chlorine is essential for the perfection of the seed, and that silica is probably necessary to uniform blossoming and ripening. It is further proved that water must enter crops through their roots; that carbon, which constitutes more than half their weight, is superbundantly furnished by the air; that air and water together yield the materials out of which fully 93 to 98 per cent. of crops is built up, and that the soil has to give for their nourishment but the 2 to 8 per cent. of mineral matters which remain as ashes when they are burned, and the $\frac{1}{2}$ to 2 per cent. of nitrogen which they also contain. It is likewise definitely settled that nitrates in the soil are the chief natural source of nitrogen, while the ammonia of manures, as well as a variety of substances containing nitrogen, and found in urine or feces in the decay of dead animals, likewise supply vegetation with nitrogen.

The experiment-stations have further ascertained, by a multitude of trials, what quantities and proportions of all these elements are needful to produce any given crop, and to what extent they are removed from the soil. On the other hand it has been determined what kinds of plant-food, and what quantities, are contained in the long list of manures and fertilizers, in all kinds of dung, urine, ashes, salts, guanos, phosphates, manufacturing refuse, &c. The remarkable quality of the soil to sift, as it were, some of the most

valuable because most costly fertilizing elements out of manures, retaining them in a form not easily or not largely removed by rain, and yet accessible to the roots of plants—the so-called absorbent or fixing power of soils—has also been elaborately studied. We have thus a pretty complete knowledge of what a crop requires for its growth, what it carries off from the land, what is returned in straw or tops, and where we may look for the most effectual and cheapest restoration of the materials thus removed. The well-instructed farmer is thereby put in possession of the data for keeping accounts between his soil and his crops, so that he can estimate with accuracy what the soil itself can be relied upon to contribute yearly toward their production, and what must be supplied yearly or during each rotation, by means of manures, in order to maintain, to develop, or to increase the fertility of the land.

THE EXPERIMENT-STATIONS AND THE TRADE IN FERTILIZERS.

One very important feature of the work of the stations is the analysis of commercial fertilizers. "It is just about twenty-five years since in Germany, as here, the trade in superphosphates, guano, and similar commercial fertilizers began. The same stupendous frauds by adulteration and dilution of good things were practiced there as they have been, and, we have great reason to fear, still are carried on here. But the experiment-station has perfectly cured and rooted out these evils in all the districts where it has been established and appreciated. The experiment-station there is prepared to furnish the farmers, at small cost, with an analysis of any fertilizer he proposes to buy. The farmers avail themselves of this aid. They will buy no fertilizer without an exact statement of its composition, and they buy with the understanding that any deficiencies in the stipulated amount of fertilizing matters shall be made good or deducted from the payment. Under such circumstances manufacturers can sell nothing that is not substantially what it claims to be. A further result of this system is that low-grade fertilizers are little sought, and those makers who can supply the best article, of uniform quality and at the lowest rates, have the business. With large sales the dealers prosper, while the consumers are satisfied with their purchases, and instead of trying to see how they can get along with small use of purchased fertilizers, they are studying how to use the greatest quantities to advantage. The fertilizer market in Saxony and Prussia, where the experiment-station has the universal sanction and confidence of the farmers, is just as settled and satisfactory as any branch of trade, and the farmers there buy superphosphate, guano, potash salts, &c., with as much security of fair dealing as we can feel in the purchase of sugar or nails."

"The German fertilizer-control system" consists essentially in arrangements by which dealers place their wares under the supervision of the stations, and guarantee them to contain certain percentages of valuable fertilizing ingredients; the guarantees being subject to verification by analyses made at the stations. Their stocks are also held open at all times to the inspection of the officers of the station, who, from time to time, without previous notice, select samples for analyses. A most important feature of the control consists in the provision very generally made by which purchasers have the privilege of having samples of the articles they buy analyzed, at small cost, or for nothing. Just here, indeed, is the superiority of the German system over the one in vogue in this country of having fertilizers examined by State inspectors. Besides an occasional examination of one or at most a very few samples of each particular brand, as the inspector may find it, the German farmers have the still further security which comes from the testing of samples of the articles they actually buy.

Illustrations of the benefit of such control-systems are as numerous as they are striking. "In the province of Saxony, in Prussia, there

was, in the year 1866, a considerable excitement about poor fertilizers. Thereupon a much more vigilant control was exercised; the result was a great improvement in the general character of the articles sold in the province during the year 1867. In Peruvian guano, for instance, there was an increase in the content of nitrogen of one per cent., or twenty pounds to the ton. It is calculated by the director of the experiment-station at Halle, that in this single item alone there was a saving to the farmers of the province of \$20,000 gold, and taking into account the increase in the other valuable constituents, phosphoric acid, potash, &c., as well as nitrogen, not only in guanos, but also in superphosphates, bone-dust, and other concentrated fertilizers, the saving must have amounted to many times this sum."

Low-grade and spurious fertilizers are detected if put upon the market in sections where control-systems are in vogue, or, to speak more accurately, are kept out of the market. Competition between different dealers comes to be based upon goodness of quality, and thus the standard is raised, and the wares become actually cheaper. Farmers buy fertilizers with confidence, and, in the light of the knowledge which comes to them from the experiments at the stations, coupled with their own experience, use them economically and profitably. And thus the agriculture, and with it the other industries and conditions of well-being in the districts where science is thus applied, are improved, and the whole community benefited.

INVESTIGATIONS OF SEEDS—THE SEED-CONTROL SYSTEM.

Of the many new ways in which science has, during the past few years, been applied to agriculture, one of the most interesting and useful is in the examination of seeds. In 1869, Dr. Nobbe, director at the station at Tharand, in Saxony, commenced the study of the seeds in common use in German agriculture, and founded the first "seed-control station." How much good has come from this may be inferred from the fact that during the seven years that have since intervened, over 4,000 samples of seeds have been examined at Tharand; that an astonishing amount of adulteration has been discovered, so much so as to exert a by no means inconsiderable effect upon the agriculture of the country; and that the importance of the work has come to be recognized so fully as to induce the establishment of a number of seed-control stations in Germany and other European countries. Various kinds of adulterations have been discovered. Sometimes these consist merely in seeds of weeds and other extraneous plants, either of inferior value or positively harmful, which have been gathered with the genuine seeds; sometimes they consist of inferior seeds purposely added to increase the bulk and weight of the wares sold. In some cases the seeds used for adulteration are deprived of vitality by previous steaming, roasting, or boiling; in others, so base are the practices to which the love of unlawful gain will stoop, not even this means is used to prevent the injury which must be brought upon the consumer by raising useless or noxious plants, instead of the useful ones he seeks. Genuine seeds which have lost their vitality by age are often mixed with fresh seeds. The most barefaced, though not the most harmful, seed-swindling discovered by Professor Nobbe, consists in grinding quartz rock, sifting out particles of the proper size, dyeing them in proper colors, and mixing them with clover-seeds. Samples of clover-seed containing 25 per cent. by weight of this admixture of colored grains of quartz can be

distinguished only by very close and careful examination from the unadulterated seed.

So patient, ingenious, and successful have been Dr. Nobbe's investigations, that he is able to distinguish with accuracy the seeds of the common cultivated plants and weeds, and to determine as well the percentages of pure seeds and adulterations, as what proportion of the genuine seeds are capable of germinating, and thus producing vigorous plants.

One outgrowth of Dr. Nobbe's work at Tharand, is his lately completed *Handbuch der Samenkunde*, a volume of 642 pages, of which 366 pages are devoted to the physiology of seeds, 138 to the means of determining their agricultural value, and the rest to the means of preventing frauds, and other topics.

Dr. Nobbe points with pride to the fact that at the time of the completion of this work there were already established in Germany some twenty seed-control stations, whose directors had almost without exception spent more or less time at the station at Tharand in preparing for their work, that still more stations were to be established in Germany, and that similar institutions were founded or proposed in Denmark, Austria, Hungary, Holland, Belgium, and Italy.

RESULTS OF WORK OF STATIONS—HOW MADE KNOWN AND APPLIED.

Those who are interested in the progress of agricultural science and the diffusion of agricultural knowledge, will find not only the organization and work of the experiment-stations, but also the ways in which their researches are made known and applied in practice worthy their careful study. An excellent indication of the state of affairs in this respect is found in the agricultural literature where the stations exist.

During the present year has appeared a work by Dr. Wolff, director of the station at Hohenheim, in Germany, entitled *Die Ernährung der landwirthschaftlichen Nutzthiere*. It is a royal-octavo volume of some 550 pages, and gives a "critical compilation of the results of the later investigations in animal physiology in their relation to the maintenance of domestic animals." It is, in fact, a compilation of the feeding experiments made (almost entirely in the German stations) since the year 1860. How great is the number of experiments whose details in part and results as a whole are herein described, may be inferred from the fact that, during the time specified, more than one thousand have been performed in which the digestibility of various food-materials by different animals has been tested, each one with a thoroughness that has never been so much as imitated on this side of the Atlantic. It is interesting, often amusing, but oftener sad to compare the vague discussions of some of even our most noted writers and talkers on cattle-feeding, with the close, patient, long-continued experimenting and carefully-attested conclusions on the same points which are given in this work.

But in order that the results of these researches may attain their greatest usefulness, they must be presented in a less abstract form—they must be explained in clear, brief terms, so that ordinary farmers may be able to read them understandingly and to apply the results to their daily practice with a fair hope of profit. Precisely this want has been met by Dr. Wolff in a little quarto volume of some 200 pages, in which the more important elementary principles concerning foods, nutrition, and feeding are explained in terms that any intelligent German farmer can readily comprehend. This volume tells just exactly what every man

who has stock to keep needs to know in order to feed most rationally and economically. A most excellent feature of the work is its price, which is only 2½ marks, or about 60 cents, gold.

Another and equally useful work by the same author bears the title *Praktische Düngerlehre*, and contains just such plain, definite, and practical information about fertilizers and manuring as the one just mentioned gives about foods and feeding. It is also a small quarto of 200 pages and is sold at the same price, 2½ marks. It speaks of air, water, and soils as sources of food for plants, and explains the general principles of vegetable nutrition, and then describes the various important fertilizing materials, their composition, value, and proper modes of application. If a farmer wants to know the characteristics of pure guano or bone, what they are composed of, how much phosphoric acid and nitrogen they ought to contain, and for what kinds of soils and crops and in what proportions they should be used, he has only to turn to the proper place in this book and learn. At the end he will find tables showing how much of the ingredients of plant-food are removed with different crops and supplied with different fertilizers, and other data which will enable him to keep account with his soil and see how the supply, by artificial means, keeps pace with the exhaustion in cropping. How useful the German farmers find this little book to be for them may be inferred from the fact that the sixth edition has been published and that the circulation has reached some 10,000 copies.

The spread and usefulness of this definite knowledge of the principles that lie at the basis of the right practice of farming is still better illustrated in the farmer's diaries in very common use among German farmers. One of these, bearing the title of "Mentzel and von Lengerke's Agricultural Calendar," is published annually in two parts, the one a pocket diary, the other for occasional reference, both together costing about 54 cents, gold. The amount of useful information and help in systematizing farm management which this little work contains is astonishing. The pocket volume furnishes a diary blank for every day in the year; tables for labor accounts; forms for registering yield of milk from each of sixty cows for each week of the year; seed and harvest tables; hay and forage tables; threshing tables; tables for entering all purchases, sales, and increase of livestock; tables for noting the destination of every kind of manure, and others for accounts of grist. Then come tables giving amounts by weight and measure of seed needed for a Prussian *morgen*, (about two-thirds of an acre,) either broadcast or in drills, for ninety-five different kinds and varieties of crops; amounts yielded per *morgen* of various crops, and so on. Then follow tables for calculating the exhaustion of soils by crops and enrichment by manures. These give the amounts of water, nitrogen, potash, soda, lime, magnesia, phosphoric acid, and so on, in not far from two hundred kinds of crops, and half as many kinds of manures, these latter being supplemented by tables for calculating how much stable manure will be produced per annum by a given number of animals; how to calculate the values of different commercial fertilizers from analyses, and so on. After these come still more elaborate fodder-tables, giving the chemical composition of nearly 250 different kinds of food for stock, with the amounts of digestible substances in each; the amounts of the digestible food-ingredients needed by different animals for dairy rations, and finally a long series of fodder-rations, or mixtures of the various foods in the proportions in which they should be fed to different animals, and for different purposes, in order to secure the most economical utilization of the nutritive material they contain. This diary is largely

circulated among the more intelligent German farmers. Another, which is published at a price of 12½ cents, gold, serves to some extent the place in the house of the smaller German farmers that patent-medicine almanacs fill with us, save that instead of puffs for all sorts of concoctions, good, bad, and indifferent, they contain tables, simpler indeed than those in the other diary mentioned, but of the same general character. The circulation of this latter is stated at 100,000 per annum.

Whoever has had opportunity to observe the methods of farming in vogue in the countries where the experiment-stations exist, cannot fail to have been impressed with the intimate and necessary connection which exists between the thorough system and economy which prevails in the practice and the care taken to promote the science of agriculture.

The article by Professor Johnson from which I have already quoted, closes as follows:

To say that the farmers of Connecticut and of our entire country urgently need the aid and stimulus of the experiment-stations, is to make a most evident assertion. Our agricultural colleges have but few agricultural students. * * * * * The reason lies mainly in the fact that our intellectual activity has the habit of running in other than agricultural channels. To bring our farmers in direct and profitable contact with the results of science, to bring science into active and visible coöperation with the toils and plans of the farm, would redound to the eminent advantage of both. The experiment-station, I cannot doubt, is to be this point of contact, the focus of this coöperation."

FACTS FROM VARIOUS SOURCES.

GRASSHOPPERS.—Two correspondents, Messrs. J. B. McCullis and C. G. Boerner, living in Vevay, Indiana, inform the Department that on the 13th of November, 1876, an immense cloud of grasshoppers alighted in that place, literally covering the streets of the town. Mr. Boerner



observed, about 5 p. m., dense cumulo-stratus clouds in the southwest, gradually overspreading the sky. At 6 o'clock the wind had risen to moderate gusts, and within half an hour a rattling noise was heard against the windows, like that of light hail. On opening the doors grasshoppers entered in immense numbers, covering the floors, furniture, clothing, &c. The shower continued till 8 o'clock p. m., when the ground was thickly covered and the boys began to burn them, shoveling them into bonfires. Mr. B. supposed that he had identified both the *Caloptenus spretus* and the *C. femur-rubrum*, but the specimen sent shows the insect to have been the *Acridium (Cyrtacanthacris) americanum*, one of our largest American grasshoppers, and more than twice as large as either the *C. spretus* or *C. femur-rubrum*. [See figure.] They are not uncommon around Washington, but this is the first case on record of their appearance in such overwhelming numbers. Their habits are similar to those of other species, and when appearing during the growing season in such numerous

swarms, great damage to vegetation might be expected from them. They were too late in this case to inflict any very serious injury.

Grasshoppers, probably some species of the *Caloptenus*, have visited several counties in the Southwest. In Baudera, Bastrop, Bell, Cooke, Gillespie, Lavaca, Mason, Williamson, Kendall, Burleson, DeWitt, Robertson, Washington, Caldwell, Bexar, Waller, Victoria, and Grayson, Texas, they were very destructive upon gardens, meadows, and pastures. What little wheat was sown they destroyed, causing the sowing to be delayed till after their departure. In Williamson their damage to the cotton crop is estimated at 15 per cent. of an average yield. In Washington the grass on the cattle-ranges is destroyed to an extent that causes apprehensions that the cattle will starve. They appear to have a special relish for the foliage of peach and other fruit trees. They have deposited millions of eggs. These counties are scattered from the northern border to the Gulf of Mexico, but are all west of the nineteenth meridian of Washington. Two counties in Arkansas, Washington and Benton, report a similar destruction. Missouri also had a more or less severe visitation in Taney, Vernon, Nodaway, and Lawrence. Kansas was again raided by these pests, and many early-sown wheat and other cereal crops were destroyed, but their ravages were such as a spring-sowing will measurably repair. They have laid immense quantities of eggs, but our correspondent in Butler, after a careful examination, is satisfied that nine-tenths of the deposit are rotten. Our correspondent in Franklin, after a half-hour's search, found but a single healthy egg. The insects were also present in numerous swarms in Cherokee, Cowley, Neosho, Crawford, Shawnee, Douglas, Labette, Jackson, Jefferson, and Woodson. In Labette barley, peanuts, and hemp were not molested by them. In Richardson, Boone, and Cass, Nebraska, they were also destructive on newly-sown cereals, gardens, fruit-trees, &c., as also in Fremont, Rio Grande, and Douglas, Colorado.

The Hamilton (Iowa) Freeman states that a gentleman, on examining the ground on which the insects had deposited their eggs, found 52 deposits in 4 square inches, or 13 per inch. The eggs in each deposit varied between 17 and 34, averaging about 25 to the cocoon. If these all hatched, there would be 325 grasshoppers on each square inch. But most of the eggs were addled by the warm weather subsequent to their deposit. It is proposed to destroy them by burning over the prairies. In Woodbury, Iowa, the insects greatly injured the potato crop.

Owsley, Kentucky, reports a great destruction of early-sown wheat by a grasshopper, which is most probably the *Caloptenus femur-rubrum*.

IRON AND STEEL MANUFACTURES.—The growth of the iron interest is in many ways subservient to advance in agriculture. In 1810 the product of pig-iron was but 54,000 tons; it more than doubled in ten years, and nearly doubled at each subsequent decennial period up to 1870, when it amounted to 1,865,000 tons, and reached 2,854,558 tons in 1872, since which time it has fallen to 2,266,581 tons in 1875. The decline was 422,832 tons from 1874. Less than one-fifth is charcoal iron, and of the remainder the bituminous slightly exceeds the anthracite.

The importation of pig-iron has nearly ceased; it was but 66,457 tons last year, and the exports were 8,738 tons; and with an increased domestic product in ten years, from 931,582 tons in 1865 to 2,266,581 in 1875, the price has declined from 58½ cents per pound to 25½, which is less than the price in 1845.

The States reporting more or less increase over 1874 are Maine, Virginia, Georgia, Indiana, Illinois, and Wisconsin. The States producing the larger proportions were Pennsylvania, 42.4 per cent.; Ohio, 18.3;

New York, 11.7; Michigan, 5; New Jersey, 2.8; Wisconsin, 2.7; Missouri, 2.6; Illinois, 2.2; Kentucky, 2.1; Maryland, 1.7.

The product of rolled iron was 1,890,379 tons, an increase since 1874. There was also an increase in rails from 727,413 to 792,512 tons.

RUSSIAN APPLES.—Several years ago the Department of Agriculture imported a collection of apple-trees from St. Petersburg. These were planted in the grounds of the Department with a view to procure and disseminate grafts for the purpose of testing their adaptability in various sections and localities, especially in the Northern and Northwestern States.

Many thousands of these grafts have been distributed, and the Department has received returns relative to their hardiness, and other particulars concerning their adaptability and value, but only from a few of the many correspondents receiving them.

Full particulars regarding their hardiness, and especially their general adaptability to rigorous climates, would be of great value, and the Department is desirous of being placed in possession of such information as may lead to an estimate of their worth.

ADVANTAGE OF HOME-PRODUCTION.—Our correspondent in Logan, Kentucky, reports that much of the aftermath of an extra fine clover crop in that county was saved for seed; enough to furnish employment for two clover-seed hullers. He estimates that a sufficient quantity has been saved to supply the farmers next spring, and that this will save within the county \$28,000 to \$30,000, the amount heretofore annually paid out for clover-seed.

PROLIFIC BEANS.—Mr. Silas M. Blanchard, of Hudson, Hillsborough County, New Hampshire, from 3 pints of pea-beans harvested 3 bushels and 18 quarts. One stalk produced 130 pods, containing 615 seed.

ALFALFA IN CALIFORNIA.—General Bidwell, of Chico, will seed 2,000 acres in this forage-plant, and other farmers will seed still larger acreages. It is estimated that the total breadth seeded will be from 35,000 to 40,000 acres.

WINE FROM MISSION GRAPES.—A correspondent of the San Francisco Morning Call remarks that the Mission grape in California makes a strong claret, while on the alluvial bottoms of the Rio Grande it yields a strong rich wine more resembling port. In the northern mountainous regions of Spain the same vines yield a deep-colored alcoholic wine considerably resembling that of California. These Spanish wines are shipped largely to France in order to be manipulated into light French claret. In California the Mission wine is largely manufactured into claret by the foreign population of San Francisco, as its high alcoholic strength will admit of free watering. The popularity of the Mission grape is rapidly waning. Even first-class wine-makers have failed to make a superior wine or brandy from it, and several have begun to graft the Mission stocks with better varieties. The writer predicts that if all the Mission vines were thus treated the character of California wines would rise 500 per cent. in the public estimation. If the Mission vines were grafted out, he says that very little poor wine would be made in the State.

CALIFORNIA RAISINS.—In 1876 the raisin-growers of California about trebled their product of the previous year. The receipts at San Francisco by the close of this year will probably have reached 60,000 boxes, against 18,000 or 20,000 last year. It is stated that one vineyard dried 240 tons of grapes, producing 80 tons of raisins. This is a specimen of the extent of this new productive interest. The dry summers of Cali-

fornia, and the regular and limited period of her annual rain-fall, give special facilities for drying in the sun. Grapes dried in this way produce much finer raisins than those dried by artificial heat. The grape-growers of California also exhibit great ingenuity in shielding their grapes against occasional and unexpected showers; frames are provided for the spreading of the fruit and are arranged for convenient handling and turning, so that all sides of the bunches may be consecutively exposed to the heat. On the approach of rain the frames may be speedily placed under cover, and when dry weather re-appears may again be spread out.

EXPORT OF AMERICAN BEEF AND MUTTON.—Six steamers of the Anchor line have been provided with refrigerating apparatus for the transport of fresh meat across the Atlantic. Cattle are brought by rail to the seaboard and killed the night before they are shipped. A current of cool air, driven by steam-power and kept up all night, sets the beef and extracts the animal heat. Carcasses are then cut in quarters and placed in the refrigerating compartments of the vessels. These are hermetically sealed, and kept cool by masses of ice in the next rooms. Air circulates between the meat-rooms and the ice-rooms by means of tubes and a pumping-engine. The temperature is kept down to 38°. A reduction to the freezing-point would greatly injure the flavor of the meat. The transportation of live cattle cannot be maintained in competition with the dead-meat trade, which is enlarging rapidly. Arrangements have been made to ship 200 carcasses per week to Glasgow alone. In cold weather the number will probably be increased. This is but a specimen of what may be expected of this dead-meat trade, which is yet but in its infancy.

STATISTICS OF NEW MEXICO.—A pamphlet issued by the New Mexico Stock and Agricultural Association states the area of the Territory at 77,568,640 acres, of which about 9,000,000 are claimed under private grants. Up to 1876, 6,148,463 acres had been entirely surveyed, besides 189,485 acres of military reserves, 1,752,969 acres Indian reserves, 4,377,750 acres of private grants, and 705 acres of mines and town-sites; total, 12,469,363 acres. Of the surveyed lands the amount technically called "offered land," is 1,630,735 acres. These are lands that have remained unsold, after having been offered at public auction. Of these, about 65,000 acres have been purchased or entered under the homestead and pre-emption laws. The residue are now open to appropriation by private entry, at \$1.25 for ordinary lands and at \$2.50 for lands within the limits of railroad-grants. Two roads have been subsidized—the Texas Pacific and the Atlantic and Pacific. A large area of confirmed private grants is ready for purchase from the grantees.

The Territory contains from 18,000,000 to 20,000,000 acres of arable land capable, with irrigation, of high cultivation. The irrigating facilities are ample, water abundant, and located on appropriate levels. The mountain country presents a large number of natural basins for the accumulation of winter and spring rains, and of water from melting mountain-snows in the summer. The soils of the lowlands are generally a rich sandy loam, composed of disintegrated rocks and volcanic ashes. Corn, wheat, oats, and barley grow well in all parts of the Territory, especially in the northern region. Corn, in the rich bottoms, with no careful culture, yields as high as 80 bushels per acre. Near Santa Fé are lands that have been in cultivation for two hundred years, without an ounce of fertilizers, and yet their productive capacity seems scarcely impaired. The Rio Grande del Norte Valley has a length, in

the Territory, of 500 miles, averaging 5 miles in breadth. Its waters, like those of the Nile, contain a rich sediment, amounting to 20 per cent., by weight, of the whole. But little engineering enterprise is necessary to render its waters subservient to irrigation. Such irrigation is equivalent to a heavy deposit of organic manures. El Paso Valley has been cultivated for two hundred and sixty-five years.

Grape-culture finds very favorable conditions, especially warm, dry summers for the elaboration of the fruit, while the frosts of winter are only sufficient to kill a number of noxious insects. All sorts of vegetables grow finely, and the temperate and subtropical fruits are generally successful in different parts of the Territory. Not one-tenth of the valleys of Rio Grande and Pecos is yet occupied, although the settlements are chiefly confined to these and a few other valleys. The Mesilla Valley, 70 miles long, has land enough for 560 farms, of 320 acres each, of admirable fertility. Farmers who settled there ten years ago without any capital are worth \$50,000 to \$60,000 to-day. Its temperature is genial and its atmosphere salubrious. The Rio San Juan region, 90 miles by 60, embraces a vast area of excellent land, and is now attracting the attention of settlers. This region lies about 100 miles northwest of Santa Fé.

The population, at the close of 1874, was 121,250; it is estimated, in 1876, at 135,000. This population embraces 7,648 Pueblo Indians, a peaceful, honest, law-abiding people, owning and working farms according to civilized laws. Their lands were ceded them in 1546 by the Emperor Charles V.

Vital statistics, especially those of the last two United States Census Reports, show that New Mexico returns the lowest death-rate from tubercular disease of any State or Territory in the United States. Bronchitis is scarcely known, while many cases of tubercular consumption are known to have been cured by residence in the Territory even after considerable lung cavities have been produced. There is a marked absence of malarial affections, but for rheumatism and other diseases of the heart the climate cannot be recommended, as it tends to enhance valvular difficulties. For general debility and nervous prostration it is claimed that no more perfect sanitarium exists on this continent.

Manufacturing facilities are excellent, though almost totally undeveloped. Anthracite and bituminous coals have been found in immense masses, while deposits of iron-ore are abundant and rich. Materials for the manufacture of leather are also abundant. The public-school system has been thoroughly organized.

Stock-raising seems destined to be the great productive industry of the Territory. An immense area of pastoral lands, covered with nutritious and abundant grasses, awaits occupation. The grama and mesquite grasses are especially valuable, as a natural process of curing in the dry season renders them available for winter-feeding. All kinds of stock thrive upon this diet, and cattle become almost as fat as if stall-fed. Merino sheep were introduced from Spain three hundred and thirty-six years ago and have grown with very little effort at improvement. Yet, though they have degenerated in size and quality of fleeces, their mutton is excellent. Judicious crosses have been made with encouraging results. The increase of lambs amounts to about 100 per cent. of the number of ewes. A flock of 5,000 ewes and 100 rams may be expected in one year to amount to 10,100, of which 7,500 will be ewes and 2,600 rams and wethers, the increase being nearly equally divided between the sexes. The wool-clip from the 5,000 sheep, at $1\frac{1}{2}$ pounds per head, amounts to 7,650 pounds, which at 22 cents a pound brings \$1,683 for the wool-

clip of the first year alone. The expense of keep is estimated at \$765, leaving \$918 for investment in 50 high-grade rams. The second year, then, will open with 7,500 ewes and 2,650 rams. If the former again double there are 15,000 sheep at the end of the second year, of which 11,250 will be ewes and 6,400 rams and wethers. Of these 10,150 will shear about 3 pounds per head, or 30,450 pounds of improved quality, which at 28 cents per pound bring \$8,526. At this point 2,500 yearling wethers may be sold for enough to purchase 1,600 ewes and 100 rams. This will give at the commencement of the third year 12,850 ewes and 4,000 rams and wethers, or 16,850 sheep in all. By converting wethers into valuable rams and ewes the process may be continued, if judicious regard be had to all the circumstances. Another element of profit is found in the fact that the fleece improves in price in proportion as it increases in weight. These figures are said to be indications of what has been successfully achieved in New Mexico. The Angora goat will do as well here as in any part of the world. The native Mexicans employ the ass and common goat, the former for transportation and the latter for milk and cheese. Horses and cattle would do as well as sheep.

The agricultural interest will also find a home market when the immense mining facilities of New Mexico are fully developed. Gold and silver deposits, both placer and vein mines, are extensive and valuable. Copper and brown hematite iron are inviting extended and profitable working. Salt occurs in beds and in lakes in different parts of the Territory. Timber is mostly confined to the mountain districts and high rolling lands. Pitch, yellow and spruce pine, cottonwood, walnut, locust, box-alder, and sugar-tree fringe the streams and cañons of the mountains. A small species of live-oak and a peculiar kind of cedar, called juniper, grow well on the southern uplands. The nut-pine or piñon is abundant and makes excellent fuel.

SHEEP-RAISING, OREGON.—Mr. W. T. Newby, of Yamhill County, Oregon, in response to a letter of the Commissioner, gives the following statistics regarding sheep-husbandry in his State. The State census of 1875 gave the number of sheep at 539,600, which evidently included lambs. The aggregate wool-product was 1,863,002 pounds.

The breeds represented range all the way from the poorest to the very best of the highly improved varieties. Thorough-bred merinos are of Spanish, French, American, and Australian origin, but Mr. Newby thinks that none except the Spanish are thorough-bred, the others being really but grades of that stock. All varieties of the merino are well adapted to the climate and circumstances of Oregon. Spanish rams range from 16 to 30 pounds per head of unwashed wool; but a ram that does not shear over 20 or 25 pounds is not considered of much value. Spanish ewes range from 10 to 18 pounds. This breed is suited to large flocks, and are supposed to be healthier and more cheaply fed than any other. They are not so good mutton-sheep as the other varieties, yet they are fair in this respect, and will average from 45 to 55 pounds per carcass when dressed. But as wool-producers Mr. Newby thinks the Spanish merinos have no equal. They are short, well formed, of excellent condition, and longer lived than other varieties. With fair treatment they also carry their wool longer, seldom losing a lock of wool from one shearing time to another; they sometimes carry their fleeces two or three years without shearing.

French merinoes are becoming unpopular and disappearing from the flocks. They are too flat and "legged," and of feeble constitution. Their fleeces are uneven, some parts being fine and others coarse. At three years of age the wool becomes harsh and dry, the lubricating oil

being saturated with yellow gum of the consistency of bee-bread. They are less desirable for cross-breeding and shorter lived than the Spanish.

The American merino is a good sheep, with moderately fine form, yielding good medium wool, at the rate of five to ten pounds per fleece.

The Australian merino has decreased in numbers in the last seven or eight years. It is of good form, though small, and yields from four to six pounds per fleece of very fine, even wool. It is well adapted to running in large flocks; but the lambs are tender, and need care when dropped. These sheep were introduced in 1857 or 1858, by a Mr. Thompson, who bought 36 head on an Australian vessel in San Francisco; crossing them with other merinos, especially with the Spanish, increased the weight of the fleece; but crosses with common sheep soon proved unprofitable. A sample of the fleece of a yearling ram, the offspring of this flock, is still preserved, the fiber being 11 inches long. Their carcass is small, but the mutton and wool are both fine.

Cotswolds were imported over twenty years ago, and were very popular for ten or fifteen years; but when the native grasses became short, and flocks had increased from 50 to 1,000 head, these sheep became less profitable, and are going out of use. They are still of value in small flocks, where mutton is in good demand at high prices, and where food is abundant and of good quality.

The Leicesters were imported about 1860, by Mr. A. McKinley, a Scotch gentleman, who had previously been in the service of the Hudson Bay Company. Another variety, called the New Oxford, is but little known, but is spoken of as superior for the production of combing-wool.

Fifteen years ago the Southdowns were very common; but their light fleeces have rendered them unpopular, and they are falling into neglect. A slight cross of the Southdown blood on other varieties is beneficial, improving the form, action, and hardiness of the resultant breed. They were imported from England by the Hudson Bay Company about twenty-five years ago.

In 1843 the Hudson Bay Company had a large flock of Spanish and Mexican sheep, of very small frames, shearing from one-half to one and a half pounds per head, and dressing but twenty-five to thirty-five pounds per carcass. A flock of 50 common sheep was brought across the plains from Missouri, by Mr. E. M. Adams, in 1847, and about the same time a flock of 75 was brought by a Mr. Shaw. These were the only sheep at that time in Oregon, including, as it then did, Washington Territory. The crossing of these flocks constituted what are termed the common breed of the country, which average from three to six pounds per fleece, and dress about fifty pounds per carcass. These sheep, if not too deeply crossed with Leicester or Cotswold, produce wool a little below medium, and excellent mutton. They do well in large flocks.

Mr. Newby estimates the average cost per annum of keeping sheep in Oregon at not over 50 cents per head, though there is a wide range of difference. East of the Cascade Mountains, where the great mass of the sheep are kept, many flocks get through the winter on the abundant and nutritious bunch-grass; but this is in localities where the snow-fall is light. A shepherd is there employed for every 1,000 head, at a salary of about \$300 per annum. Sometimes hay, to the extent of 40 tons per 1,000 head, is provided, at the cost of \$5, per ton; but frequently not over half the hay is used.

In the Willamette Valley flocks range from twenty-five to three hundred head, some reaching as high as two thousand or three thousand. The cost here varies from about nothing to seventy-five cents per head.

Even in the latter case, the fertilizing value of the droppings exceed the cost of the maintenance.

The wool-product shown by the State census of 1875, divided by the number of sheep, gives an average product of 3.45 pounds per head; but as lambs unshorn were largely counted among the animals, the average is too low. It should probably be 5 pounds per head. The annual increase from droppings of lambs is about 90 per cent.

The number of acres necessary to pasture 100 sheep varies in different localities and with different kinds of sheep, Cotswolds and Leicesters requiring more than merinos. The merinos might be kept on 1 acre per head; the others would require $1\frac{1}{2}$ acres. For fleeces ranging from thoroughbred to one-fourth merino, Mr. Newby received, in 1874, from 25 to 30 cents per pound; in 1875, 25 cents per pound, averaging the whole. His neighbors got from 21 to 23 cents per pound. These prices are for unwashed wool. No wool is washed in Oregon.

Sheep here are generally healthy, but some prevalent forms of chronic distemper are noted. The scab results from bad management. The malady is easily cured by dipping in a decoction of tobacco mixed with blue vitriol and lime. No other chronic complaint is of sufficient importance to provoke attention; but Mr. Newby describes a new malady, which has become quite prevalent in some localities, for which he finds neither name nor description in works on sheep-husbandry. The premonitory symptoms are a dry cough, with swelling lips. The swelling continues for 2 or 3 weeks, and, if fatal, enlarges the lips 2 or 3 inches, turning them perfectly black and producing a very offensive odor, with a very repulsive appearance. A putrid state of the whole carcass necessitates great determination to complete a post-mortem examination. A free administration of tar is recommended. The appetite does not fail to the last. For lack of a more definitely known cause, Mr. Newby suggests that the disease may result from extreme short pasture on fallow lands, the animals absorbing a large amount of dust.

Mr. Newby concludes that sheep raising has proved profitable. A man with 150 acres can raise from 200 to 500 bushels per annum more of wheat if he keeps sheep than without them. Add this to the wool and product, and he thinks there is a very substantial element of profit in the business. Sheep-raising is a far better policy than the summer fallowing of partially worn-out lands. The grain farmers are finding this out, and are importing Cotswolds and other mutton-sheep. Wool-production is rapidly increasing in Oregon, which promises soon to take the front rank in the business.

CALIFORNIA STATISTICS.—The returns of county assessors show 2,156,149 acres in wheat in California in 1874, producing 30,248,000 bushels; 490,274 acres in barley, producing 9,261,940 bushels; 65,217 acres in oats and 40,922 acres in maize, producing, together, 3,122,000 bushels; 586,705 acres in hay, producing 752,214 tons. Smaller areas were sown in rye, buckwheat, pease, flax, hops, tobacco, cotton, &c. Los Angeles County raised a third of the corn-crop.

The live-stock embraced 1,385,877 cattle, 5,464,711 sheep, 242,819 hogs, 230,622 horses, 22,257 mules, 837 asses, and 44,426 Angora goats. The wool-product had doubled within five years, amounting to 43,532,223 pounds, of which 22,746,730 pounds were spring-clip, 19,225,493 fall-clip, and 1,560,000 pulled wool. The wool shipped during the year amounted to 48,183,000 pounds, a large portion of which was Oregon wool; 3,612,206 pounds were consumed by the woollen mills of the State.

Of wine, 7,000,000 gallons were made in 1875, the quality being re-

ported as inferior to that of 1874, especially in red wines. Inferior brands are in excess of the demand of the market, and a large stock of the three previous years is left over. Mission-grape wines are delivered on board ship for 50 cents per gallon, while higher-class wines reach 80 cents or \$1. A large quantity of grapes is made into raisins by the Alden process, which has been found very successful.

Sheep-farming by its old methods has about reached its limit. Sheep ranches are now too valuable for this branch of production, and it is difficult to secure a large run. Sheep are driven in large flocks into New Mexico and Colorado. The alfalfa or lucern grass is a new element in the problem of sheep-raising, which promises to overcome the most important difficulties with which this industry has to contend.

The influx of population is steady and an addition of 60,000 is expected during 1876. This immigration has created a considerable demand for home-produce, and especially has kept the flouring-mills busy at remunerative prices.

BRAZILIAN STATISTICS.—The first regular census of the Brazilian Empire was completed several months ago, and the tables officially published July 31, 1876. These show the total population to be 11,441,284, of whom 9,930,478 are free and 1,510,806 slaves. The free population includes 243,481 foreigners. As the territory of the empire includes 3,856,000 square miles, an equal distribution would not allow three persons to each square mile. As the population is mostly gathered in a few localities, immense regions of unoccupied territory are found in all parts of the empire. A considerable population in these wastes were too isolated for the census-takers, and hence a small addition may be made by estimate to the aggregate reported in the tables. The population in 1820 was estimated at 3,500,000, and at the accession of the present enlightened emperor, in 1831, at 5,000,000. Immigration has never been very large, and hence the natural increase must have been extraordinary to triple the population in a little over half a century. This is one of the most remarkable facts in the history of race development, especially in view of the destructive visitations of yellow fever, small-pox, and other epidemics operating in the leading centers of population on the coast. The late war with Paraguay reduced the population at least 100,000; including lives lost and slaves escaped.

The facts in regard to sex have been very imperfectly ascertained. Of the free population 4,318,699 are males and 4,100,973 females, leaving 1,510,806 whose sex is not stated—probably children under the age of puberty, which arrives very early in the southern European races that peopled South America. These figures show about 105 males to each 100 females. Of the males 2,975,446, or 69 per cent., are single; 1,165,866, or 27 per cent., are married; 177,387, or about 4 per cent., are widowers. Of the females, 2,752,582, or 67 per cent. are unmarried; 1,121,000, or 27½ per cent., are married, and 127,391, or 5½ per cent., are widows. Of the male slaves 711,869 are reported as single, 73,079 as married, and 20,222 as widowers. Of the female slaves 622,804 are reported as single, 63,010 as married, and 19,816 as widows. This enormous disproportion indicates a very low social morality among the slave population.

The census tables embrace 15,848 blind, 11,595 deaf-mute, 40,869 crippled, and 15,309 idiotic and insane individuals. The Indians inhabiting the unoccupied Brazilian territories exhibit few, if any, cases of these infirmities. The Brazilian civilized population, however, embraces an unusual number of individuals over one hundred years of age, a few in

the interior being reported as one hundred and forty and one hundred and fifty years old; only a third of the free males over sixteen, and a fifth of the free females are able to read. Very few slaves have this measure of culture. Of the 1,902,454 individuals between six and fifteen years of age (941,782 boys and 960,672 girls) only 155,651, or $16\frac{1}{2}$ per cent. of the boys, and 165,098, or $17\frac{1}{2}$ per cent., of the girls attend school; that is about 84 per cent. of the children of the appropriate school-age, are not furnished with facilities for education. The publication of these statistics has produced a profound sensation throughout the empire.

AGRICULTURAL STATISTICS OF URUGUAY.—A descriptive work by General Reyes states the total area of the republic of Uruguay at 46,189,804 acres, or somewhat less than that of Nebraska. Of this area 32,499,693 acres, or nearly three-fourths of the whole, are occupied by cropping or grazing. The land in crops is but 2.68 per cent. of the area actually occupied. Pastoral husbandry, then, has over 31,000,000 acres for the support of 6,327,500 cattle, 554,726 horses, 6,437 mules, 13,005,244 sheep, and 400,000 or 500,000 hogs and goats. The total value of these animals is about \$30,000,000. The total value of pastoral and cultivated lands, \$70,800,000. Adding \$128,400,000 on for structures of all kinds and \$6,000,000 for unenumerated property, the total of these items is \$2,352,000,000.

BRITISH AGRICULTURAL RETURNS.—The official returns just issued show, during 1876, a total acreage in Great Britain under all kinds of crops, bare, fallow, and grass, of 31,546,949 acres, an increase of 130,599 acres, or 0.4 per cent., over 1876. England returns 24,194,091 acres, an increase of 81,782; Wales, 2,712,097 acres, an increase of 15,954; Scotland, 4,640,761 acres, an increase of 32,863. The total acreage under cereals was 9,184,769 acres, a decrease of 266,881, or nearly 3 per cent.; England, 7,278,286, a decrease of 250,257; Wales, 498,968, a decrease of 13,210; Scotland, 1,407,515, a decrease of 3,414. The total acreage in wheat, 2,994,957 acres, a decline of 347,524 acres, or nearly $10\frac{1}{2}$ per cent.; barley and bere, 2,533,109 acres, an increase of 23,408; oats, 2,789,530 acres, an increase of 125,521; rye, 56,210 acres, an increase of 1,307; beans, 517,556, a decrease of 46,625; pease, 293,407, a decrease of 22,968. England has 94 per cent. of the wheat acreage, losing nearly 10 per cent. from 1875; about 6 per cent. of the acreage is assigned to Wales and Scotland, the proportion of the former being a little the greater; both show a considerable decline from last year. Of the acreage in barley and bere, England has about 83 per cent.; Wales, 6 per cent., and Scotland 11 per cent.; it increased in England and Scotland, but fell off in Wales. England has about 55 per cent. of the acreage in oats; Wales, 9 per cent., and Scotland 36 per cent., all showing increase. England reports 81 per cent. of the rye acreage; Wales 3 per cent., and Scotland 16 per cent. England has 94 per cent. of the acreage in beans; Wales, 1 per cent., and Scotland 5 per cent. England has 98 per cent. of the acreage in pease, and Wales more than half of the remainder.

Under green crops, 3,577,111 acres are reported, falling short of 1875, 86,996 acres, or about $2\frac{1}{2}$ per cent.; England fell from 2,848,473 acres to 2,754,803; Wales from 131,085 to 129,466; Scotland rose from 684,549 to 692,842. Potatoes declined from 522,653 acres in 1875 to 505,088 in 1876; England had 60 per cent.; Wales, 8 per cent.; Scotland, 32 per cent. Turnips and swedes covered 2,148,441 acres, an increase of 5,743; England had 73 per cent. of this acreage; Wales, 3 per cent.; and Scotland, 24 per cent. The acreage in mangel fell from

361,617, in 1875, to 347,889 in 1876, nearly the whole being in England. Carrots occupied 16,129 acres, an increase of 1,193, seven-eighths of the acreage being in England. Cabbage, kohlrabi, and rape were returned at 179,475 acres, a reduction of 10,258; nearly the whole was in England. Vetches, lucerne, and other green crops, not including clover or grass, fell from 432,470 acres in 1875 to 380,089 acres in 1876; England, 359,759 acres; Wales, 5,854; Scotland, 14,476.

The flax-crop rose from 6,751 acres to 7,641, nearly the whole being in England. Under hops, England had 69,999 acres against 69,171 in 1875; none reported in either Wales or Scotland. The bare fallow rose from 557,979 acres to 651,212 acres, England having all but 43,307. The grass acreage under rotation was 4,540,273 acres, an increase of 186,202, a little less than half being devoted to hay production; of this area about 61 per cent. is in England, 30 per cent. in Scotland, and 9 per cent. in Wales. In permanent pastures, meadows or grass, not in rotation, (excluding heath or mountain land,) the reported acreage is 13,515,944 acres, an increase of 203,323; 10,688,629 are in England; 1,697,946 in Wales, and 1,129,369 in Scotland.

Of farm-animals, horses have increased from 1,340,129, in 1875, to 1,374,576, in 1876, England having 1,057,545; Wales, 128,363, and Scotland, 188,668; about 70 per cent. are used solely for agriculture. The total number of cattle was 5,847,802, a decrease of 165,022; this includes 2,227,867 cows and heifers in milk or with calf; of the cattle, other than cows, about 57 per cent. are under two years old. The total number of cows fell off during the year, 25,374; England has 1,573,656; Wales, 259,462; Scotland, 394,749. The total number of sheep was 28,172,951, a reduction of 994,487; about two-thirds are over a year old; England reports 18,320,091; Wales, 2,863,141; Scotland, 6,989,719, all three showing a reduction in their numbers. Swine increased from 2,229,918 to 2,293,620, all sections showing increase; England reports 1,924,033; Wales, 215,488; Scotland, 154,099.

AGRICULTURAL STATISTICS OF IRELAND.—Official returns show the total acreage in Ireland under crops of all kinds during 1876 to have been 5,206,053 acres, or 126,170 less than in 1875, and 63,519 less than in 1874. The total area in cereals was 1,848,487 acres, viz: wheat 119,357, a decline of 39,398; oats 1,487,086, a decline of 14,781; barley 220,662; a decline of 13,241; bere and rye, 9,232, a loss of 1,098; beans and pease 11,910, an increase of 197; net decrease, 68,321 acres. The acreage in flax was 132,878, an increase of 31,704. The area in green crops was 1,363,224 acres, viz: potatoes 880,693, a decline of 19,893; turnips, 344,721, an increase of 12,183; mangel-wurzel and beet-roots, 48,631, an increase of 5,407; cabbage, 33,546, falling off, 1,400; carrots, parsnips, &c., 36,026, losing 1,103; vetches and rape, 19,607, a decline of 2,125; net loss of green crops, 6,931 acres. The area in meadow and clover was 1,861,464 acres, a decline of 83,212.

The decline in general acreage under crops is shown in each of the four provinces of Ireland. The area in grass, not including meadow or clover, was 10,507,249, or 97,920 more than in 1875, all the provinces except Ulster showing an increase. Fallow lands occupied 11,652 acres, or 788 more than in 1875, the increase in Munster and Ulster more than counterbalancing the decrease in Leinster and Connaught. Woods and plantations were returned at 324,028 acres, an increase of 5,363, which was distributed through all the provinces. Bog and waste lands amounted to 4,278,214 acres, an increase of 22,689; Leinster and Ulster showing an enlargement and Munster and Connaught a falling off. The total agricultural area is given at 20,327,196 acres.

Of cereals, the wheat acreage shows a steady decline during each of the last six years, having fallen from 244,541 acres in 1871 to 119,597 in 1876. The oats acreage is about what it was in 1871, having been considerably larger in some of the intermediate years. Barley, bere, rye, beans, and pease have about held their own. Of green crops, potatoes, with some fluctuation, have shown a declining tendency, having fallen from 1,058,431 acres in 1871 to 880,693 in 1876. Turnips, mangel, beet-root, carrots, parsnips, &c., have steadily enlarged their acreage, while vetches and rape have fallen off. The area in flax is larger than any year of the last five, having gradually declined, till in 1875 it amounted to but 101,174 acres. The acreage in meadow and clover is larger than in 1871, but less than in 1874 and 1875.

Of farm-animals, horses and mules numbered 556,630, an increase of 8,511; the aggregate of 1876 was only exceeded by that of 1872, 560,804, during the last ten years. Asses numbered 182,614, an increase of 2,259 over 1875, and the largest annual aggregate for ten years. During the last decade the number of cattle increased from 3,707,803 in 1867 to 4,147,102 in 1873, declining in the subsequent years to 4,113,693 in 1876, a loss of 1,595 compared with 1875. Sheep have steadily declined; the greatest aggregate of the past ten years was 4,901,496 in 1868, and the smallest 4,007,518 in 1876, a decrease of 246,509 from 1875. The aggregates of swine have greatly fluctuated during ten years, ranging from 869,578 in 1868 to 1,621,423 in 1871; in 1876 the returns showed 1,424,143, an increase of 172,087 over 1875. The number of goats regularly increased from 190,429 in 1867 to 270,691 in 1875, and then fell off to 264,246 in 1876. Poultry shows a uniform annual increase from 10,334,309 in 1867 to 13,582,782 in 1876, an increase of 1,443,644 compared with 1875.

THE ENGLISH HOP TRADE.—A correspondent of the Mark Lane Express estimates the English production as follows: Mid Kent district, 17,000 acres and 119,000 cwt.; East Kent, 12,000 acres and 78,000 cwt.; West and North Kent, 4,000 acres and 12,000 cwt.; Weald of Kent, 10,000 acres and 60,000 cwt.; Sussex, 11,000 acres and 55,000 cwt.; Worcester and Hereford, 9,000 acres and 13,500 cwt.; Surrey and Hants, 5,500 acres and 33,000 cwt. The total area is given at 68,500 acres, and the aggregate product 370,500 cwt., or 5.41 cwt. per acre. The writer quotes a recent circular of a leading firm of brewers, stating that crops on the continent are everywhere short; in Bohemia, especially, there is a general failure. An average crop on the whole continent would produce from 1,000,000 to 1,200,000 cwt., whereas the actual yield is supposed not to exceed from 260,000 to 300,000 cwt., while the actual consumption is between 550,000 and 600,000 cwt., and the stock remaining over is supposed to be between 150,000 and 180,000 cwt. In England old stocks are remarkably low.

BRITISH FLOUR AND GRAIN IMPORTS.—The returns of the board of trade show the following imports of flour, meal, and grain for the first ten months, respectively, of 1875 and 1876:

	Quantity.		Value.	
	1875.	1876.	1875.	1876.
Wheat from Russia.....cwt.....	8, 143, 034	6, 611, 977	£ 4, 174, 025	£ 3, 261, 708
Denmark.....do.....	339, 150	260, 260	184, 020	145, 343
Germany.....do.....	4, 602, 944	2, 037, 874	2, 563, 564	1, 163, 902
France.....do.....	944, 060	236, 200	506, 152	128, 217
Turkey, including Roumania.....do.....	703, 446	1, 177, 555	336, 069	538, 434
Egypt.....do.....	1, 357, 061	1, 932, 683	681, 745	818, 461
United States.....do.....	20, 462, 736	17, 033, 575	10, 774, 772	9, 044, 677
Chili.....do.....	630, 376	939, 364	348, 103	488, 060
British India.....do.....	720, 040	2, 387, 551	363, 018	1, 184, 194
British North America.....do.....	2, 870, 458	2, 029, 586	1, 554, 609	1, 081, 961
Other countries.....do.....	1, 111, 631	3, 150, 717	637, 360	1, 762, 961
Total wheat.....do.....	41, 884, 936	37, 797, 342	22, 123, 437	19, 617, 918
Barley.....do.....	8, 675, 124	6, 755, 628	3, 640, 361	2, 633, 233
Oats.....do.....	10, 646, 459	9, 359, 957	4, 649, 052	3, 861, 944
Pease.....do.....	1, 210, 048	1, 202, 471	558, 653	530, 193
Beans.....do.....	2, 760, 341	3, 886, 227	1, 249, 176	1, 558, 824
Maize.....do.....	17, 658, 700	35, 343, 867	7, 075, 266	11, 322, 369
Total grain.....do.....	82, 835, 608	94, 345, 492	39, 295, 945	39, 524, 481
Wheat meal and flour from Germany.....do.....	604, 820	736, 703	486, 875	603, 565
France.....do.....	1, 457, 659	870, 719	1, 136, 904	705, 275
United States.....do.....	1, 885, 228	2, 010, 156	1, 429, 462	1, 462, 687
British N. America, do.....	244, 480	712, 999	178, 906	153, 064
Other countries.....do.....	644, 391	1, 083, 010	607, 689	942, 298
Total flour and meal.....do.....	4, 836, 578	4, 918, 587	3, 839, 836	3, 866, 889
Indian meal, including maizena.....do.....	6, 252	6, 361	9, 470	13, 324
Total grain, flour and meal.....do.....	87, 678, 438	99, 270, 440	43, 145, 251	43, 404, 694

The above table shows that the total import, including grain, flour and meal, increased 13.2 per cent. in quantity, and 0.6 per cent. in value. Unmanufactured grain increased 14 per cent. in quantity, and 0.5 per cent. in value. The wheat import fell off $9\frac{3}{4}$ per cent. in quantity and $11\frac{1}{3}$ per cent. in value. The wheat import from the United States declined $16\frac{3}{4}$ per cent. in quantity and 16 per cent. in value; that of Russia, 19 per cent. in quantity and 22 per cent. in value; that of Germany, 56 per cent. in quantity and 55 per cent. in value; that of British North America, 29 per cent. in quantity and 30 per cent. in value; France, about 75 per cent. in quantity and value; Denmark, 23 per cent. in quantity and 21 per cent. in value. The other countries increased their import, viz: Turkey, 67 per cent. in quantity and 60 per cent. in value; Egypt, 42 per cent. in quantity and 20 per cent. in value; Chili, 49 per cent. in quantity and 40 per cent. in value; British India, 231 per cent. in quantity and 226 per cent. in value; countries unenumerated, 183 per cent. in quantity and 177 per cent. in value. These facts show a tendency to purchase cheaper wheats and to enlarge trade with countries with which the United Kingdom has had but medium relations hitherto. All the great wheat countries supplying the British market have curtailed their contributions. The United States, the largest contributor, furnished 45 per cent. in quantity and 46 per cent. in value in 1876, against 50 and 49 per cent. in 1875; Russia fell from $19\frac{1}{2}$ to $17\frac{1}{2}$ per cent. in quantity and from 19 to 16 per cent. in value; Germany fell from 11 per cent. in quantity and $11\frac{1}{2}$ per cent. in value to $5\frac{1}{2}$ per cent. and 6 per cent.; France declined from about $2\frac{1}{4}$ per cent. of the

total quantity and value to less than 1 per cent.; Denmark's quota was less than 1 per cent. in both years. On the other hand, Turkey's import rose, in quantity, from less than 2 per cent. to over 3 per cent. of the whole, and, in value, from $1\frac{1}{2}$ per cent. to nearly 3 per cent.; Egypt, in quantity, from $3\frac{1}{4}$ to over 5 per cent., and, in value, from about 3 to over 4 per cent.; Chili, from $1\frac{1}{2}$ to nearly 3 per cent. of the total quantity, and from $1\frac{1}{2}$ to nearly $2\frac{1}{2}$ per cent. of the value; British India, from $1\frac{3}{4}$ per cent. to nearly 7 per cent. of the total quantity, and from $1\frac{1}{2}$ to over 6 per cent. of the value; unenumerated countries from $2\frac{1}{2}$ to over 8 per cent. in quantity, and from less than 3 to nearly 9 per cent. of the total value.

Of other raw grains, barley fell off 22 per cent. in quantity, and nearly 28 per cent. in value; oats, 12 per cent. in quantity and 17 per cent. in value; pease, 0.6 per cent. in quantity and 5 per cent. in value; on the other hand, beans increased 40 per cent. in quantity and 25 per cent. in value; maize increased over 100 per cent. in quantity and 60 per cent. in value. The last item is especially remarkable, showing a tendency to import more of the cheaper cereals for stock-food and even for human subsistence.

Of flour and wheat-meal, the total quantity increased $1\frac{1}{2}$ per cent. in quantity and 0.7 per cent. in value. The United States slightly increased her proportion, furnishing about 39 per cent. of the quantity in 1875, and 40 per cent. in 1876. France, next in rank, furnished but 17 per cent. of the whole quantity imported in 1876, against 30 per cent. in 1875; Germany increased her proportion of the total quantity from $12\frac{1}{2}$ to 15 per cent.; British North America from 5 per cent. to over 14 per cent.; other countries from $13\frac{3}{4}$ per cent. to 22 per cent.

Indian-meal imports increased slightly in quantity and about 50 per cent. in value.

The sudden increase in the import of wheat from India has attracted especial attention among European publicists and statisticians. Some attribute it to temporary causes, especially to the decline in the value of silver in Europe without any corresponding decline in India. It is stated that an English wheat importer can now procure by exchange 10,000 rupees for £833, whereas the Hindoo money still retains its old purchasing power of £1,000. This difference pays the cost of transportation to England, and leaves an additional margin of profit. It is argued that this state of things can only be temporary, and that the equilibrium between supply and demand will ultimately absorb this margin, and place the India wheat-trade upon a par with that of other countries. Others argue that the great improvement in internal transportation in the Anglo-Indian empire, and the construction of the Suez Canal, have created a class of economic conditions which will give this trade a permanent vitality, especially as the cotton production of Hindostan has begun to decline, leaving labor and capital available for cereal production.

WINE-POISONING IN FRANCE.—The public mind of France is becoming greatly excited in view of the artificial coloration of wines by means of poisonous ingredients. The feelings of indignation and alarm at this growing evil have manifested themselves in some very formidable demonstrations. Numerous municipal bodies and commercial associations have lately addressed the French government in very strong terms, portraying the extent of the evil by statistics, and calling for efficient measures of repression. Among these official utterances is a communication to the minister of justice, written by M. Paul Massot, president

of the council-general of the Eastern Pyrenees, who was deputed by the council to present their complaint against the evil in question. M. Massot wishes to enforce the protest of a large number of chambers of commerce which have already been presented to the government. The wines of Italy and Spain have long been adulterated by an infusion of elderberries, and this fraud has gradually become common in the viticultural districts of France, to the serious injury of the legitimate production of the country. But this substance, though misleading wine-consumers and merchants as to the real character of the wines in market, is of little consequence in comparison with the virulent poisons which endanger the life and health of the consumer. Arsenical compounds of fuchsin and *grenat*, a secondary product in manufacture of fuchsin, are now used extensively. The latter had no commercial value until this process of wine-poisoning came into such extended use, but now it sells at very remunerative prices. These ingredients are mingled with other matters, and their villainous character is concealed by very innocent specific names given to the compounds, such as *colorine*, *caramel*, &c. Few of these are sold that do not contain aniline, salts of rosaniline, or the residuary elements left by the production of fuchsin.

M. Massot cites a statement published in the *Annales d'Hygiene Publique* for July, 1876, that in the single village of Odeillan a grocer of Narbonne sold ammoniacal cochineal to the extent of 10,000 francs (\$2,000) annually, and that this was but one-third of what was known of the extent of the trade in artificial coloring-matters in that village. A very large number of these preparations are very destructive of health. Even in wines colored with elderberries large infusions of alum and other drugs have been detected.

M. Massot states that the revenue-officers, judging wines only from appearance and taste, are incompetent to detect these frauds, and hence he calls for a legal chemical test for both foreign and native wines which shall ascertain the character and extent of these adulterations, and thus place the public on guard against injurious products. Numerous specimens of every brand of wine marketed should be subjected to analysis, and the vending of wines not conforming to these analytic tests should be treated as frauds on the public, for which severe penalties should be meted out to the perpetrators. M. Massot calls upon the municipal authorities of Paris to apply to adulterated wines the same principles of regulation which visit fine and imprisonment upon venders of tainted meats and vegetables.

In the department of Herault, which is credited with a production of nearly 250,000,000 gallons of wine in 1875, the agitation of this question is becoming daily more earnest. The syndicate of wine-traders of the arrondissement of Beziers, at its reunion September 11, 1876, after citing the grave injuries inflicted by every process of artificial coloration upon the quality and reputation of French wines, and especially directing attention to the illicit trade in colorine, caramels, &c., resolved upon the constitution of a syndical commission specially charged with the analysis of specimens of wines marketed through the agency of the syndicate. This commission is to furnish, at the expense of the syndicate, analyses of every kind of wine subjected to its inspection, and especially of those suspected of adulteration. The greatest publicity is to be given to its transactions, and every practicable measure looking to the suppression of the evil is to be energetically used.

The syndicate of commerce of Certe, in a memorial to the minister of agriculture and commerce, citing the repeated complaints of artificial coloration of southern wines by different syndicates in the south, as well

as in Paris, asks the minister to take such measures as will prevent the sale of adulterated wines. The *Journal Officiel*, noticing the repeated and increasing complaints from official bodies and private persons, states that all commissaries of police have been instructed to give their immediate and close attention in this matter. When a brand of wine is suspected of being adulterated, it is to be seized and subjected to analysis by the chemical commission of *arts et métiers*; if it be found to have been tampered with it is to be poured into some brook or river, and the perpetrators of the fraud punished according to law.

The syndicate of wine-merchants in Paris charge that the process of wine-coloration has created growing uneasiness ever since the vintage of 1845, when it suddenly grew to rather formidable proportions. Its influence upon the quality, reputation, and prospects of French wine-production is declared to be very injurious. The questions raised affect both public morals and public health. All tampering with the wine-product by adding elements abnormally changing its character, misrepresenting its real condition, even when not affecting the health of the consumer, are clearly fraudulent, creating false impressions in regard to the value of the product. But some frauds are also destructive of health. The ingredients used, such as arsenical fuchsine and rosaniline, are deadly poisons, as has been clearly demonstrated by scientific experiment. The syndicate do not object to strengthening weak wines with alcohol or sweetening sour wine with sugar. As this is but increasing the proportion of some of the normal elements of the wine itself, it is not regarded as an objectionable adulteration. The syndicate ask the government, through the minister of commerce, for a law imposing penalties upon the adulteration itself and for the confiscation and destruction of all artificially colored wines. In a discussion of this proposition before the Political Economy Society of Paris, a member urged that the practice of coloring wines grew out of the heavy duties imposed upon wine-production since the war. These duties, he says, have so raised prices that cheaper kinds are used, yet consumers desire the articles set upon their tables to bear the appearance, at least, of the better brands. It is to meet this factitious demand that this miserable fraud is perpetrated.

Moved by very numerous and earnest representations of this evil from different parts of the republic, the French executive government has taken cognizance of the question, and developed its line of action in a circular addressed by the minister of justice to the government law-officers in the different jurisdictions. The only coloration which is regarded as a falsification of wine, under existing laws, is that in which substances not legitimate elements of wine are used to modify it. That should be repressed, outside of any fraud committed by the vender. Even where the coloring-matter is not injurious to health, it is illegal and merchants keeping it are to be prosecuted. In case of coloration by injurious substances, the power of the magistrate is ample, and should be energetically exerted to repress the evil. Prosecutions had previously been ordered in some arrondissements as early as June, 1876, and all officers are exhorted to diligence in the work of repression.

PROTECTION AGAINST THE PHYLLOXERA.—A recent number of the *Comtes-Rendus* states that M. Gachez, after long and patient research, has become convinced that rows of grape-vines with intercalary rows of red maize are completely shielded from the ravages of the phylloxera, the insect abandoning the roots of the vine to prey upon the roots of the maize. M. Gachez tried this method upon vines, the roots of which, last spring, were covered with these insects. In September, the most

careful examination failed to detect a single one on the vines. The roots of maize planted in a field alongside the vineyard did not present any trace of the phylloxera.

M. Pignède found an effective remedy in digging, during March and April, a trench 4 inches deep around his infested vines, and throwing in 500 grams (1.1025 pounds) of burnt lime. He then whitewashed the vine after having removed its bark. This operation, he declares, destroyed the greater part of the insects and their eggs, and arrested the hatching of the eggs already deposited upon the vine. The first year afterward the vines gave out vigorous shoots, and the second year fine grapes in large quantities. The lime, applied to healthy vines, preserves them from the attacks of the phylloxera.

NATIONAL AGRONOMIC INSTITUTE OF FRANCE.—The republic, which sprang from the revolution of 1848, signalized its devotion to the productive interests of France by organizing at Versailles (October 3, 1848) an agricultural university with the above title, a school of the highest rank, and embracing the widest range of agricultural and zootechnic studies then known. The full significance and value of the enterprise was but superficially understood by those who were charged with its primary organization. Its legitimate university character was ignored, and its resources were mostly limited to the maintenance of a museum of living type-animals. Its large experimental area of 1,525 hectares (3,362.22 acres) was absorbed mainly by horse-farms, cattle-farms, sheep-farms, &c., leaving but a small portion for investigations outside of zoötechny. It contained representatives of all the European types of farm-animals, including 300 cattle, 120 horses, and 2,000 sheep. It very imperfectly represented other great branches of agricultural production.

In 1851 its direction was confided to Count Gasparin, one of the most illustrious agronomists of the nineteenth century, who at once recognized the errors of its previous administration, and projected radical reforms intended to realize more thoroughly the legitimate aims of a university. He abandoned the cumbrous and expensive farm organizations which parceled out the experimental area, discharged a host of supernumerary officials, and cut down the expenses of administration. He retained a sufficient number of choice animals to fully illustrate specific types of reproduction, and the remainder he sold or distributed among the regional and farm schools devoted to special cultures. He organized a system of general experimental culture and instruction, embracing all branches of agricultural production, just such as was suited to the wants of all the agricultural regions of France.

But these nobly administrative reforms were rendered nugatory by a decree dated September 17, 1852, issued by authority of Louis Napoleon, President of the French Republic, whereby the Agronomic Institute of Versailles was suppressed, on the pretext that its curriculum of studies was too extended and abstract for the necessities of French agriculture. The corps of instructors was disbanded, and the costly material that had been gathered was either scattered or wasted. The experimental grounds grew up in briars, thistles, and wild shrubbery, and became the hunting-grounds of the imperial myrmidons of the second empire. This reactionary measure has been deeply deplored by French agronomists as retarding, to an incalculable degree, the scientific development of agriculture in France.

The republican principle, which has finally predominated in the reconstitution of the French government, exhibited its true instinct of progress in re-organizing, by act of August 9, 1876, the National Agronomic

Institute. Its headquarters will be at the *Conservatoire des Arts et des Metiers*, in Paris, with an experimental area of 50 hectares (126½ acres) at Vincennes, four miles east of the city. The great ideas of Gasparin will direct its re-organization, and its resources will be devoted to the highest scientific instruction, leaving minor specialities to the regional and farm schools, which are better adapted to specific lines of inquiry and experiment. Three great regional high schools make a special study of the agricultural needs of the northern, western, and southern regions of France. The school of Grignon, in the department of Seine-et-Oise, not far from Paris, devotes chief attention to *grande culture*, grasses, cereals, "industrial" crops, and stock breeding, which have a characteristic development in the high culture of the northern departments. An agricultural station attached to this school gives facilities for extended experimental researches. The school of Grand-Jouan, in the department of Loire-Inferieure, studies especially the methods of bringing virgin lands under culture, mixed pastoral husbandry, tenant-farming, natural meadows, live-stock breeding, "industrial" and fruit crops, &c., with reference to the less elaborate agricultural system of the west and center. The school of Montpellier, in the department of Hérault, represents the agricultural peculiarities of the Mediterranean region, embracing the replanting of forests, irrigation, and other great enterprises. Its sericultural and viticultural station gives special facilities for the development of two grand leading interests of southern agriculture. The farm-schools still further differentiate the methods of experiment and instruction of young farmers, so as to adapt them to the wants of local communities. With all these facilities for specific lines of investigation and discipline, it is evidently the true policy to confine the movements of the great central university to the higher and more abstract truths which underlie the whole subject of agriculture. Hence the experimental area will be quite limited compared with its original dimensions, and its management will be directed only to the investigation and illustration of general principles.

The law for the re-organization of the institute passed both houses of the French legislature August 9, 1876. Two days later the minister of agriculture announced the commission of re-organization, embracing the leading agriculturists, private and official, of the republic. This commission have established the following among their general regulations: The pupils will be divided into two general classes, day pupils and free hearers; no boarding pupils being admitted, as in the regional and farm schools in the rural districts. Day pupils must either present diplomas showing that they have received from some respectable literary institution the degree of bachelor of science, or they must pass examination in a course of study equivalent to what is usually required for such a degree. Free hearers are admitted without any questions as to literary qualifications. Day pupils pay a tuition-fee of 300 francs per annum; free hearers, 25 francs. Four scholarships of 1,000 francs foundation and two of 500 francs have been established. Ten gratuitous scholarships are to be divided equally between the regular graduates of the subordinate agricultural schools and other claimants. Diplomas will be given to those satisfactorily completing the course of study, and the two highest in scholastic merit in each graduating class will receive a complimentary mission of extended study either in France or in some foreign country.

By decree of October 9, 1876, on the nomination of the commission of organization, the minister of agriculture, M. Teisserenc de Bort, appointed the following members of the board of instruction and experi-

mentation: M. Boussingault, director of laboratory researches; M. Leonce de Lavergue and M. Ed. Leconteux, professors of rural economy; M. Edmund Becquerel, of physics and meteorology; M. Delesse, of geology; M. Carnot, of mineralogy; M. Schloesing, of agricultural chemistry; M. Peligot, of analytical chemistry; M. Aimé Girard, of agricultural technology; M. Ed. Prilleux, of botany; M. Emile Blanchard, of zoology; M. Tresca, of mechanics; M. Hervé Mangon, of rural engineering; M. Moll, of general agriculture; M. E. Risler, of comparative agriculture; M. Tassey, of sylviculture; M. du Breuil, of horticulture, arboriculture, and viticulture; M. Victor Lefranc, of legislation and agricultural jurisprudence.

These men are among the foremost scientific agriculturists of France. M. Lavergue is a senator, quite a number are members of the Institute of France; the others are nearly all professors of scientific institutions, of whom several were members of the faculty of the old Agronomic Institute when under the presidency of Count Gasparin.

FRENCH INTERNATIONAL EXPOSITION.—The exposition will be opened May 1, 1878, and continue till October 1 following, at Champ de Mars and Trocadero. The objects exposed will be arranged in nine groups, viz: I. Works of art; II. Education and instruction, including the processes and materials of the liberal arts; III. Household furniture, &c.; IV. Cloths, clothing, &c.; V. Extractive industries, crude products; VI. Tools and processes of mechanical industries; VII. Alimentary products; VIII. Agriculture and pisciculture; IX. Horticulture. The above groups will be subdivided into ninety classes, of which only the following pertain to agriculture and horticulture:

GROUP V.—*Class 44: Products of forestry exploitations and industries*, viz: Specimens of peculiar forest trees; timber for construction, working, and fuel; lumber for ship-building and for construction of buildings on land; cork; textile-barks; tanning, coloring, odoriferous and resinous materials; dried wood and charcoal; crude potash; cooperage, basket-work; wooden shoes; esparto-grass fabrics, &c.

Class 46.—Agricultural products not alimentary, viz: Textile matters, raw cottons; flax and hemp, either dressed or undressed; textile fabrics of all sorts; wool, washed and unwashed; silk-cocoons; agricultural products employed in industry, pharmacy, and domestic economy; oleaginous plants, oils, waxes, and resins; tobacco, in leaf and manufactured; tanning and coloring matters; touchwood; forage-plants preserved, and other matter specially prepared for the feeding of farm animals.

GROUP VI.—*Class 51: Materials and processes of rural and forest exploitations*, viz: Plans of culture, rotation of crops and agricultural management; materials and operations of agricultural engineering; drainage; irrigation; plans and models of farm buildings; tools, machines, and engines for working the soil, for sowing, planting, harvesting, and storing crops; machinery moved by animal or steam-power; materials for farm transportation; locomotive machinery and methods; organic and mineral fertilizers; apparatus for the physical and chemical study of soils; methods of re-afforesting denuded areas; management and culture of forests; materials of forest exploitations and industries; materials, instruments, and machines for manufacturing tobacco.

Class 52: Materials and processes of agricultural manufactories and of alimentary industries, viz: Factories of artificial fertilizers and tile-drains; dairies, cheese and butter factories; fecula, starch, and oil factories; breweries and distilleries; sugar factories and refineries; ate-

liers for the preparation of textile materials; silk-worm nurseries; bakeries and bakers' ovens; utensils for the manufacture of pastry and confectionery; apparatus for manufacturing alimentary paste, sea-biscuit, &c.; for the preparation of chocolate and the roasting of coffee; fabrication and preservation of ice and the preparation of ices and sherbets.

GROUP VII.—*Class 60: Cereals and farinaceous products and their preparations*, viz: Wheat, rye, barley, rice, maize, millet, and other cereals, in grain and in flour or meal; grain, hulled and in grits; fecula of potatoes, rice, and lentils; gluten; tapioca, sago, arrowroot, cassava, and other feculent matters; mixed farinaceous products; Italian pastry, vermicelli, macaroni, &c.; substitutes for bread, puddings, domestic pastry, &c.

Class 71: Fat alimentary bodies, milk-diet and eggs, viz: Edible fats and oils; milk, fresh and preserved; butter, salt and fresh; cheese; eggs of all sorts.

Class 72.—Meats and fishes.—Viz: All sorts of salt meats and meats preserved by different processes; cakes of meat, and soup; hams and preparations of meat; poultry and game; fish, salt and packed; codfish, herrings, &c.; fish preserved in oil, sardines; pickled mackerel; lobsters, shrimps, oysters, and their preparations, anchovies, &c.

Class 73.—Vegetables and fruits.—Viz: Potatoes; dry farinaceous vegetables, such as beans, lentils, &c.; cabbages, &c.; carrots, turnips, &c.; onions, garlic, &c.; salads; gourds; citrons; melons; vegetables preserved by different processes; fruits, fresh, dry, and prepared; prunes, figs, raisins, &c.; fruits preserved without the agency of sugar.

Class 75.—Fermented drinks.—Wines, common red and white; sweet, mixed, and sparkling; cider, perry, and drinks extracted from cereals; fermented drinks from vegetable sap, milk, and all sorts of saccharine matters; brandy and alcohol; gin, rum, tafia, kirschwasser, &c.

GROUP VIII.—*Class 76.—Specimens of rural exploitations and of agricultural workshops.*—Types of rural buildings of different countries; of stables, sheep-folds and sheep-parks, piggeries, and other establishments for the breeding and rearing of farm-animals; materials for the construction of the foregoing; apparatus for preparing food for live-stock; steam plows, harvesters, mowers, fanning-mills, thrashing-machines, &c. types of agricultural manufactories, distilleries, sugar factories and refineries, breweries, distilleries, fecula and starch factories, and silk-worm nurseries; presses for wine, cider, and oil, &c.

Class 77.—Horses, asses and mules.

Class 78.—Cattle, buffaloes, &c.

Class 79.—Sheep and goats.

Class 80.—Swine, rabbits, &c.

Class 81.—Barn-yard fowls.—Types of poultry, pigeons, pheasants, &c.; apparatus for artificial hatching.

Class 82.—Dogs.—Shepherd's dogs, watch-dogs, hunting-dogs, fancy dogs; specimens of kennels, &c.

Class 83.—Insects, useful and injurious.—Bees; silk-worms and other moths; cochineal; material for the raising and preservation of bees and silk-worms; materials and processes for the destruction of injurious insects.

Class 84.—Fishes, crustaceans and mollusks.—Aquatic animals, useful in the living state; aquariums; processes of pisciculture; materials for the breeding of fish, mollusks, &c.

GROUP IX.—*Class 85.—Greenhouses, and materials of horticulture.*—Tools of gardeners, viticulturists, and horticulturists; apparatus for

watering and keeping the turf; large greenhouses with their appurtenances; small conservatories for the apartment and for the window; aquariums for aquatic plants; water-jets and apparatus for ornamenting gardens.

Class 86.—Flowers and ornamental plants.—Species of plants and specimens of culture illustrating the characteristic types of gardens and residences of each country.

Class 87.—Kitchen-garden plants.—Species of plants and methods of culture characteristic of each country.

Class 88.—Fruits and fruit-trees.—Species and methods illustrating the pomology of different countries.

Class 89.—Seeds and plants of forest trees.—Species of plants and methods of culture characteristic of different countries.

Class 90.—Greenhouse plants.—Specimens of cultures adapted to different countries, either for utility or pleasure.

The juries of admission to these several classes have been appointed, embracing leading scientific, industrial, and commercial men of France.

VITAL STATISTICS OF SWITZERLAND.—The Swiss Federal Bureau of Statistics has recently published a general statement of births, deaths, and marriages in Switzerland during the first quarter of the current year. The number of marriages is about 1.8 per each 1,000 inhabitants, or 5,012 in all, the population being stated at 2,750,135 souls. This would give an average of 7.2 per 1,000 for the whole year, whereas the average from 1867 to 1871 was about 7. This figure is lower than that of other European populations. Italy, from 1868 to 1870, averaged 7.4 per 1,000; France, 8 per 1,000 from 1861 to 1865; England 8.1, and the grand duchy of Baden 8.4, from 1867 to 1871; Bavaria, 8.5 from 1864 to 1868; Austria, 9.6 from 1867 to 1871.

The total number of births during the first quarter of 1876 was 23,612, which would give 35.88 per 1,000 inhabitants for the entire year, if the proportion was uniform. But the dead-born amounted to 1.55 per 1,000, or 4.3 per cent. of the total number of births. The proportion of male births is unusual, 106.8 to 100; this proportion is still greater among the dead-born, which show 121 males to 100 females. The proportion of total births for the quarter is greater than the average of past years.

Not counting dead-born infants, the total of deaths was 19,195 during the quarter; including those, the proportion of deaths was 29.48 per 1,000. As the rate of mortality is usually greater during the winter, this average is too large for the whole year. From 1867 to 1871 this average in Switzerland was 25.6 per 1,000. The regular average of Hamburg, with its urban population, is 26.5 per 1,000 inhabitants.

WOOL PRODUCTION AND MANUFACTURE IN GERMANY.—M. Maurice Block, a prominent French statistician, gives the following results of a voluminous analysis of German wool-trade reports, embracing 102 chambers of commerce and about 200 societies, reunions, and great manufacturing establishments. Wool manufacture in Germany ranks in importance next to that of England and France. It employs 1,250,000 spindles for carded wool and 530,000 for combed wool, while Austro-Hungary has but 600,000 for the former and 80,000 for the latter; Italy has 250,000 for the former and 28,000 for the latter. France has 2,398,929 spindles working up unmixed wool and 403,453 mixed wool, without regard to the method of preparation. England reports 3,165,569 spindles for carded wool and 2,182,792 for combed wool.

During three years, from 1872 to 1874, Germany imported on an

average about 110,236,000 pounds of uncarded wool, 4,400,000 pounds of combed wool, and 6,600,000 pounds of what is called "artificial" wool—a synonym for shoddy. Of spun wool she receives from 30,000,000 to 32,000,000 pounds not colored and 4,500,000 pounds colored; of tissues and felt about 11,000,000 pounds, fulled but not printed, and about half that quantity not fulled. Her import of upholstery and other manufactures is small. The export of unmanufactured wool shows a wide range of variation, amounting to about 40,000,000 pounds in 1872, 26,000,000 in 1873, and 48,000,000 in 1874. Combed wool shows less fluctuation, averaging about 550,000 pounds per annum, and shoddy 16,500,000 pounds. Unmixed wools average 11,000,000 pounds; tissues, fulled but not colored, ranged from 11,500,000 pounds to 16,000,000 pounds; tissues, not fulled, from 14,850,000 pounds to 18,260,000 pounds. The exports include about 1,760,000 pounds of wool in upholstery, and 1,100,000 to 1,210,000 pounds in other small wares.

Germany in combing-wool fabrics finds her most formidable rival in France, which has easy access to the original supply markets for raw material, large accumulations of capital, and an abundance of skilled labor. Many German weavers have their wool spun in France. This branch of manufacture has but lately been inaugurated in Belgium, but it is developing rapidly, and promises soon to invade the German markets if no further tariff-duties be imposed. Switzerland, with an abundance of cheap labor and unused natural motive-power, also sends spun wool to Germany. Austria and Russia are both dependent upon Germany and Alsace for spun wool. Carpet manufacture was inaugurated in 1854 under a strong tariff protection, and so long as that policy was maintained this industry flourished, but since its abrogation English carpets have measurably driven German carpets from their own home markets. The tariff question in Germany is beset by the claims of conflicting interests both at home and abroad, and the reports cited by M. Block attest the confusion in which the subject is involved.

POPULATION OF GERMANY.—The “Year-book” of Saxony for 1877 gives the population of the German Empire by States for 1871 and 1875 as follows:

States.	1875.	1871.	Percentage of increase, (+), decrease, (—).
Prussia	25,723,754	24,641,539	+ 1.07
Lunenburg	48,808	49,546	— 0.38
Bavaria	5,024,832	4,863,450	+ 0.82
Saxony	2,760,586	2,556,244	+ 1.99
Württemberg	1,881,505	1,818,539	+ 0.85
Baden	1,506,531	1,461,562	+ 0.76
Hessia	882,349	852,894	+ 0.85
Mecklenburg-Schwerin	553,734	557,707	— 0.18
Sachsen-Weimar	292,933	286,183	+ 0.58
Mecklenburg-Strelitz	95,648	96,932	— 0.35
Oldenburg	319,314	314,591	+ 0.37
Brunswick	328,352	312,170	+ 1.26
Sachsen-Meiningen	194,463	187,957	+ 0.85
Sachsen-Altenburg	145,844	142,122	+ 0.65
Sachsen-Koburg-Gotha	182,673	174,339	+ 1.17
Anhalt	213,689	203,437	+ 1.23
Schwarzburg-Rudolstadt	76,676	75,523	+ 0.38
Schwarzburg-Sondershausen	67,480	67,191	+ 0.11
Waldeck	54,673	56,224	— 0.70
Reuss, (old line)	46,985	45,094	+ 1.03
Reuss, (new line)	92,375	89,032	+ 0.92
Schaumburg-Lippe	32,941	32,059	+ 0.68
Lippe	114,254	111,135	+ 0.69
Lübeck	56,912	52,158	+ 2.18
Bremen	142,645	111,402	+ 3.82
Hamburg	388,618	338,974	+ 3.41
Alsace-Lorraine	1,529,408	1,549,738	— 0.33
German Empire	42,757,982	41,058,792	+ 1.03

STATISTICS OF SAXONY.—In an address before the Economic Society of Saxony, Herr von Langsdorff stated that, according to the census of 1871, 16.21 per cent. of the Saxon people are engaged in agriculture, forestry, gardening, viticulture, hunting, and fishing; 51.83 per cent. in mining and manufactures; 10.13 per cent. in commerce; 11.82 per cent. were day-laborers and servants; 0.96 per cent. in the army and navy; 4.15 per cent. in other occupations, and 4.90 per cent. without regular occupation. Agriculture, though occupying but a small portion of the population, is by no means an unimportant industry. A dense population, by its greater demand for soil-products, induces a more effective culture, and renders agriculture a more complete specialty, in which every improved process is placed under immediate requisition.

Some years ago Saxony raised enough of agricultural produce to cover her own consumption, but her imports of grain and meat have gradually increased, showing in 1874 an excess over exports of 424,521,660 pounds of grain, and 17,957,174 pounds of meat, with proportionate amounts of butter, lard, vegetables, fruits, &c. This surplus is drawn mostly from Eastern Europe.

This state of things is attributed principally to the rapid increase of population, which rose from 1,595,668 in 1834 to 2,556,244 in 1871, an increase of 60.19 per cent. in 37 years. Meat consumption increased at an almost equal rate during that period, rising from 38.4 pounds per capita in 1839 to 60.8 pounds in 1874, or 58 per cent. in 35 years. Agricultural production has increased but moderately. Taking two periods of four years each, 1846-'50 and 1868-'72, the average wheat product of the former period was 2,926,000 centners, and of the latter 3,238,000 centners, an increase of only 10.6 per cent.; rye production increased from 5,466,000 centners to 5,598,000, or 2.4 per cent.; barley, from 2,018,000 to 2,359,000, or 16.9 per cent.; oats, from 3,974,000 to 4,901,000, or 23.3 per cent.; the total product of these four crops, from 14,384,000 centners to 16,096,000, or 11.9 per cent. A centner is equal to 113.37 pounds.

Reckoning 10 sheep or goats, or 3 hogs as equivalent to one head of cattle, there were in 1839 667,638 head, and in 1869 774,961 head, showing an increase in 30 years of only 16 per cent. The average carcass weight of cattle was 352 pounds in 1840, 406 in 1851, 423 in 1860, and 482 in 1869; the carcass weight of swine averaged 105 in 1840, 128 in 1851, 154 in 1860, and 165 in 1869—that is, in 30 years the average weight of cattle increased 37 per cent. and of swine 57 per cent. The demand for meat has grown much more rapidly than the production.

Within fifteen or twenty years, the wages of skilled labor have advanced from 40 to 100 per cent. This has attracted labor from agriculture to manufactures, and from the country to the city. In some parts of the country reliable labor is scarce, so that instances are related in which hay has rotted in the meadow, potatoes have frozen in the ground, and over-ripe grain has perished in the field, for lack of harvest-hands to gather and house the crops.

PROGRESS OF ITALIAN AGRICULTURE.—The agricultural interest in Italy displays increasing vitality, and is making demonstrations upon the general market of Europe, causing some concern to foreign nations which have hitherto nearly monopolized several branches of trade. Wine production especially has made great progress of late years, and has attained an annual yield of 32,000,000 hectoliters, (845,369,600 gallons.) The wines of Italy approach the excellence of French wines in color, body, and bouquet. Their good qualities result less from culture and management than from superb natural conditions of soil and climate. The wines of Southern France will be especially affected by the competition of Italian wine. But other branches of peninsular agriculture are developing unexpected vitality. The markets of Germany, Austria, and Russia are becoming familiar with Italian vegetables and fruits, in their fresh and luscious state. Italian farmers are employing annually a smaller amount of commercial fertilizers, but they are enlarging the manufacture of farm-yard manures, and they are learning to concoct their own artificial fertilizers from original elements.

The Italian stock-raisers' congress lately held its fifth annual session at Padua, under the presidency of Professor Keller, who, in his inaugural address, insisted that in Italy live-stock production is on an inadequate scale. While the Italian farmer is satisfied with 12 head of cattle per square kilometer, (247.1282 acres,) a Hungarian would count 16; an Englishman, 23; a Dutchman or Belgian, 42. In Italy there are 130 cattle for each one thousand inhabitants, while in many other European states the proportion is 300 or 400 per thousand people. The professor urged the improvement of the breeds of Italian cattle and a more intel-

ligent application of the laws of animal hygiene as an essential part of the future agricultural policy of Italy.

Official statistics show that the kingdom contains nearly 9,000,000 sheep, the larger proportion being in the southern provinces, where rational cultivation of the soil is hampered by the traditional ideas of fallowing. More land is annually brought under cultivation as the government is gradually releasing land-owners from the pressure of ancient customs. Contrary to popular prejudices persistently held, the breaking up of fallow brings improved conditions both to cropping and livestock interests.

On a vast plain in the province of Capitanata, known as the Tavoliere delle Puglie, comprising nearly 750,000 acres, two-thirds of which has been preserved unbroken and used only for pasturage, the accumulation of sheep-droppings is wonderful. These deposits have also attracted the attention of agricultural chemists. From October to May, about 600,000 sheep are annually kept on the plain of Puglie, their summer pastures being on the mountains of Abruzzo. They are divided into flocks ranging from 500 to 15,000, and averaging about 2,000 head. They are kept at nights in rectangular enclosures on ground with a sufficient declivity to carry off the water and protect the sheep from the north winds. Of late years large sheds have been erected to shelter the flocks. This has resulted in a difference in the composition of the manure. That dropped in the open air, dissolved by the rain, baked by the sun, and trampled by the animals, is reduced by mixture with the soil to a kind of organic mold which constitutes an excellent manure, and is obtainable at a low price. The droppings accumulated under the sheds, being protected from the action of the sun and rain, are but little decomposed and preserve their fertilizing matters intact. These will bear a greater transportation, and very large quantities are annually sold to the neighboring farmers. The latter kind is richer in organic matter and ammoniacal salts as well as in soda, but not so rich in phosphoric acid, potash, sulphuric acid, oxide of iron, lime, and magnesia; they also contain less water.

MEAT CONSUMPTION IN EUROPE.—M. Zundel, a veterinary surgeon residing in Strasburg, has published a work on the general aspects of meat consumption in Europe, in which he attempts to determine from statistical and physiological inquiries the proportion of animal to vegetable diet in different countries. He estimates the average annual consumption per capita of meat by different races, as follows: Spanish, 24½ pounds; Italian, 33.07; Swedish, 52.91; Prussian, 55.12; Austrian, 57½; Belgian, 66½; French, 68.35; South German, 77½; Mecklenburger, 83½; English, 180½.

These results are very remarkable. Taking the consumption of the Englishman as a standard of comparison, that of the Spaniard is but 13.4 per cent.; Italian, 18.4; Swede, 29.27; Prussian, 30.49; Austrian, 31.72; Belgian, 36.59; Frenchman, 37.77; South German, 42.69; Mecklenburger, 46.33. If these statistics present even a respectable approximation to the real facts, they show that the Englishman consumes about twice as much meat as any other European. The first article of the report of the Royal Agricultural Society of England for 1876 estimates the average consumption of the United Kingdom at 114 pounds per capita; the average is known to be much larger in England than in either Ireland or Scotland.

A marked difference is also observable in the annual meat consumption of city and rural populations in Europe. In cities of 10,000 inhabitants or over the estimates range from 110 to 165 pounds per capita, while the great capitals show an immensely greater consump-

tion: Berlin is credited with 176 pounds per capita; Vienna, 209; Paris, 242½; London, 264½. This very large city consumption must greatly reduce the average of the rural districts, but statistical inquiry has not yet gathered enough local and elementary facts for generalizations of even approximate accuracy.

The conclusions of M. Zundel have raised several very interesting questions among European statisticians, some of which seem to unsettle what have hitherto been received as established truths. Comparing the Englishman and the Spaniard, the extremes in the above series of flesh-eaters, the former consumes seven and a half times as much meat per annum as the latter. Whatever muscular superiority may be claimed for the Englishman, it is evident that he is not equal to seven and a half Spaniards. Hence his surplus of meat consumption is not all expended in the production of brawn and muscle. The cold, humid climate of the British isles demands a larger amount of the concentrated aliment found in animal food, in order to maintain the average normal tone of the system, than the dry, hot climate of the Spanish peninsula. But it is a well-known fact that the flesh-eating races of Northern Europe have always excelled the vegetarians of the Mediterranean peninsulas in massive physical strength.

Again, the difference between city and rural consumption requires an extended range of facts for its explanation. It would be exceedingly rash to assume that city people are better fed, on the average, than country people, considering the number and necessities of the indigent classes of each. It is notorious that in physical health and strength the peasantry have the advantage. The excess of city consumption does not, then, operate to enhance the muscular or vital force of the population; it is needed to repair the waste of physical energies resulting from quickened nervous activity. The numerous and wearing excitements and agitations of a multitude crowded into a small space, and in a constant struggle for subsistence in mechanical or commercial occupations, generally of a sedentary character and calculated to repress the free development of physical manhood, create a constant drain upon the constitution, which can be met only by the free use of food in which the nitrogenous elements are abundant and readily assimilable. Some, who are not disposed to question the preceding generalization in regard to meat consumption, suggest that the peasant finds his proportion of azote in other kinds of food, as, for instance, the oats diet of Scotland. Others contend that the excess of meat consumption in the larger cities is greater in appearance than reality; that the facilities for statistical inquiry in the rural districts and in smaller towns being more limited, the results do not approximate so nearly to the truth. It is agreed that nothing in the later developments of this question invalidates the principle hitherto accepted, viz, that in two individuals of equal constitution and organic force, living in the same climate and under other circumstances equally influencing vital action, the sum of mechanical effects will be in proportion to the amount of nitrogen actually assimilated.

M. Zundel's statistics indicate an inferior quality in the meat consumed by the populations of Central Europe outside the great cities. Cattle-dealers agree that in rural markets well-fattened animals are not more profitable than those in moderate conditions—that the fattening process is in many instances one of unmingled loss. In Southern Germany the net meat product of the animal formerly amounted to 53 or 54 per cent. of the live weight, and of late has fallen as low as to 45 per cent. Formerly in Paris the proportion was from 55 to 60 per cent., but of later years has fallen to 52 and 55 per cent. The English have always demanded a high standard, and hence their marketed animals are expected to net 65 or even

per cent. A French statistician, M. Gayot, in the *Journal Pratique d'Agriculture*, contends that M. Zundel has understated the French standard, which has not degenerated, but still shows from 55 to 60 per cent. He claims as a characteristic of French production that a step of progress once realized is never lost, and that every improvement there possesses a permanent character. He further contends that the English standard has been exaggerated by M. Zundel. The English market-animals being of essentially adipose tendencies, yield a larger proportion of fat than the more brawny breeds of other countries. French stock-raisers have fallen into the error of excessive fattening, and some of their adipose specimens lately exhibited at the Palace of Industry in Paris have called forth sharp criticisms in the French agricultural press. A writer in the *Journal Pratique d'Agriculture* contends that this policy is diminishing the volume and robust temperament of the choice breeds of England, and also depreciating their capacities for milk-production, as is shown by the increasing importation of butter and cheese. The Durham breed especially exhibits this degeneracy in temperament and milking qualities. Fancy prices have stimulated the reproduction of fashionable forms and a specific *embonpoint*, while a pampering treatment in warm stables, with blanket-coverings, and a stimulating, farinaceous diet have undermined the choice animals of this breed. The critic had before him an engraving of a type-specimen of the Durham cattle, executed in 1801, and representing their points at the beginning of this century. The inscription gave them the name of the Holderness breed, which subsequently was transmuted into the name Durham. The gigantic proportions of the animals represented contrast strongly with the delicate type-specimens which attract sentimental British breeders of to-day. Beauty of form but ill compensates the massive and brawny development which has disappeared in the modern Durham. Capacity to produce rapidly and abundantly a superior quality of marketable meat is not identical with that which brings out symmetrical forms, for these may result from the packing of adipose matter under the skin, and the fat-forming tendency can govern only by depressing the flesh-forming principle. Excessive precocity combined with adipose tendencies renders the meat of less nutritive value, especially to the laboring-man, whose ration of consumption must be increased in order to secure the requisite amount of nitrogenous aliment.

M. Zundel finds, after careful examination, that sanitary regulations in regard to the sale of flesh of diseased animals have lost force and efficiency of later years either through the failure to re-enact provisions of old laws in modern revisions or from the adverse tendencies of construction that have prevailed in judicial tribunals. In 1858 a law journal in France declared that these repressive regulations had no foundation in the law as carefully interpreted, and that tribunals enforcing it had recourse to strained interpretations of the legal text. This is a question which will probably attract attention both from a scientific and a legal stand-point.

RAILROAD-MILEAGE OF THE WORLD.—The *Moniteur Industriel Belge* sums up the railway-mileage of the world as follows:

In Europe, the British isles have 16,354 miles; France, 14,190; Belgium, 1,049; Switzerland, 1,018; Germany, 12,075; Denmark, 538; Sweden, 2,261; Norway, 275; Russia, 12,075; Austria, 6,104; Hungary, 3,986; Roumania, 515; Turkey, 650; Greece, 7; Italy, 4,675; Spain, 3,243; Portugal, 527—total 81,816.

In Asia, Turkey has 205 miles, Caucasus, 186; British Indies, 6,371; Ceylon, 51; Java, 166, Japan, 17—total for Asia, 6,996.

Australia has 1,396 and New Zealand 151, making, for Oceania, 1,547.

In Africa, Egypt has constructed 1,107; Algeria, 319; Cape of Good Hope and Natal, 66; Mauritius, 66—total for Africa, 1,588 miles.

In North America, the United States has 79,988 miles; Canada, 4,002; Mexico, 333; Cuba, 334; Jamaica, 26; Costa Rica, 42; Honduras, 52—total for North America, 84,817.

In South America, Columbia has 50 miles; Bolivia, 28; Venezuela, 8; Brazil, 786; Paraguay, 43; Uruguay, 358; Argentine Republic, 1,367; Chili, 753; Peru, 994—total for South America, 4,387.

Grand total for the world, 181,151.

COTTON MANUFACTURE AND CONSUMPTION IN THE WORLD.—A writer in the *Economiste Français* estimates, in round numbers, the spindles in the cotton-factories of Europe and America, with their average annual consumption of cotton, as follows: England, 35,000,000 spindles, consuming 1,264,000,000 pounds of cotton; United States, 9,859,000 spindles and 563,000,000 pounds; France, 5,200,000 spindles and 197,000,000 pounds; Germany, 5,100,000 spindles and 228,000,000 pounds; Switzerland, 2,500,000 spindles and 56,000,000 pounds; Russia, 2,000,000 spindles and 120,000,000 pounds; Austria, 1,600,000 spindles and 106,000,000 pounds; Spain, 1,400,000 spindles and 67,000,000 pounds; Belgium, 650,000 and 27,000,000 pounds; Italy, 500,000 spindles and 14,000,000 pounds; Denmark, 300,000 spindles and 18,000,000 pounds; Holland, 250,000 spindles and 9,000,000 pounds; total, 64,089,000 spindles and 2,669,000,000 pounds.

This estimate assigns to England 54.61 per cent. of the spindles and 47.36 per cent. of the consumption; to the United States, 14.96 per cent. of the spindles and 21.09 per cent. of the consumption; to France, 8.11 per cent. of the spindles and 7.38 per cent. of the consumption; to Germany, 7.95 per cent. of the spindles and 8.54 per cent. of the consumption.

The average annual consumption of each spindle throughout the world is 41.64 pounds; in England, 36.11; the United States, 58.7; France, 36.32; Germany, 44.71; Switzerland, 22.40; Russia, 60; Austria, 66.25; Spain, 47.85; Belgium, 41.54; Italy, 28; Denmark, 60; Holland, 36.

Ellison & Co., in their annual review of the cotton-trade for the season of 1875-'76, state that the number of spindles in the United Kingdom, at the close of 1874, was 37,515,000, not including doubling spindles; from 1,250,000 to 1,500,000 have been added since, raising the aggregate to about 39,000,000; a large number of the old spindles have been replaced by new ones. They estimate the amounts of cotton delivered to the spinners and actually consumed by them as follows: 1872-'73, 1,280,640,000 pounds delivered and 1,227,453,000 pounds actually consumed, leaving a surplus of 53,187,000 pounds; 1873-'74, 1,240,706,000 pounds delivered and 1,259,836,000 pounds consumed, leaving a surplus of consumption 19,130,000 pounds, to be deducted from the surplus delivery of the preceding year; 1874-'75, 1,198,838,000 pounds delivered and 1,224,377,000 pounds consumed, making a still further draw upon the surplus of 1872-'73 of 25,539,000 pounds; 1875-'76, delivery and consumption, each estimated at 1,270,287,000, leaving a surplus delivery of 8,518,000 pounds yet unconsumed.

The number of spindles and the consumption of cotton on the continent are estimated by Ellison & Co. as follows; Russia and Poland, 2,500,000 spindles and 150,000,000 pounds of cotton, averaging 60 pounds per spindle; Sweden and Norway, 305,000 spindles and 19,825,000 pounds, averaging 65 pounds per spindle; Germany, 4,650,000

spindles and 255,750,000 pounds, averaging 55 pounds per spindle; Austria, 1,555,000 spindles and 104,185,000 pounds, averaging 67 pounds per spindle; Switzerland, 1,850,000 spindles and 46,250,000 pounds, averaging 25 pounds per spindle; Holland, 230,000 spindles and 13,800,000 pounds, averaging 60 pounds per spindle; Belgium, 800,000 spindles and 40,000,000 pounds, averaging 50 pounds per spindle; France, 5,000,000 spindles and 210,000,000 pounds, averaging 42 pounds per spindle; Spain, 1,750,000 spindles and 80,500,000 pounds, averaging 46 pounds per spindle; Italy, 800,000 spindles and 44,800,000 pounds, averaging 56 pounds per spindle; total for the continental manufacture, 19,440,000 spindles and 965,110,000 pounds, averaging 49.6 pounds per spindle. Adding for the United Kingdom 39,000,000 spindles and 1,270,287,000 pounds of cotton, averaging 32.57 pounds per spindle, and we find for the whole of Europe 58,440,000 spindles and 2,235,397,000 pounds, averaging 38.25 pounds per spindle. The United States, with 9,600,000 spindles, consuming the past season 1,356,598 bales, which, at 450 pounds per bale, (rather an understatement,) gives an aggregate consumption of 610,468,100 pounds, averaging 63.59 pounds per spindle; adding these aggregates to the preceding, we obtain as the approximate aggregate of the whole civilized world, 68,040,000 spindles and 2,845,865,100 pounds of annual consumption, averaging 41.81 pounds per spindle.

Ellison & Co. estimate the deliveries of cotton in Great Britain during the last season at 1,270,287,000 pounds, of which 64.56 per cent. were from the United States, 15.87 per cent. from the East Indies, 7.88 per cent. from Brazil, 9.87 per cent. from Egypt, and 1.82 per cent. from other countries. The total consumption of continental Europe is estimated at 1,026,374,000 pounds, of which 46.38 per cent. were from the United States, 35.88 per cent. from the East Indies, 4.27 per cent. from Brazil, 6.50 per cent. from Egypt, and 6.97 per cent. from other countries. The aggregate deliveries of all Europe amounted to 2,296,661,000 pounds, of which 56.23 per cent. were from the United States, 25.05 per cent. from the East Indies, 6.22 per cent. from Brazil, 8.33 per cent. from Egypt, and 4.20 per cent. from other countries.

The aggregate deliveries in Europe, the proportions received from the leading cotton-countries, and the average weights of the bales delivered during the last six cotton-seasons were as follows:

FOR ALL EUROPE.

Seasons.	Total deliveries.		From United States.	From East Indies.	From Brazil.	From Egypt.	From other countries.	Average weight per bale.
	Pounds.	Bales.						
1870-'71	2,161,721,000	5,587,000	Per cent. 54.47	Per cent. 23.45	Per cent. 10.76	Per cent. 6.03	Per cent. 5.29	Pounds. 386.9
1871-'72	1,820,870,000	5,113,000	40.72	27.07	18.89	5.91	7.38	356.1
1872-'73	2,083,278,000	5,528,000	46.02	27.62	13.39	7.36	5.61	376.8
1873-'74	2,133,819,000	5,518,000	49.33	27.80	10.87	6.81	5.19	386.7
1874-'75	2,093,100,000	5,418,000	47.75	29.80	11.35	6.09	5.01	386.3
1875-'76	2,296,661,000	5,570,000	56.23	25.05	6.23	8.33	4.16	412.3

FOR GREAT BRITAIN.

1870-'71	1,263,024,000	3,222,000	59.74	17.32	11.76	7.48	3.70	392
1871-'72	1,127,520,000	3,132,000	45.09	21.01	21.32	7.63	4.95	360
1872-'73	1,280,640,000	3,335,000	49.59	22.09	15.27	9.17	3.88	384
1873-'74	1,240,706,000	3,149,000	54.01	20.96	13.12	9.05	2.86	394
1874-'75	1,198,838,000	3,077,000	52.19	21.71	14.98	7.96	3.16	389.6
1875-'76	1,270,287,000	3,017,000	64.56	15.87	7.88	9.87	1.82	421

FOR THE CONTINENT.

Seasons.	Total deliveries.		From United States.	From East Indies.	From Brazil.	From Egypt.	From other countries.	Average weight per bale.
	Pounds.	Bales.						
1870-'71	898,700,000	2,365,000	<i>Per cent.</i> 47.28	<i>Per cent.</i> 31.84	<i>Per cent.</i> 8.96	<i>Per cent.</i> 4.06	<i>Per cent.</i> 7.86	380
1871-'72	693,350,000	1,981,000	33.87	36.65	15.04	3.28	11.16	350
1872-'73	802,638,000	2,193,000	40.58	36.02	10.53	4.60	8.27	366
1873-'74	893,113,000	2,369,000	43.09	36.89	7.89	3.84	8.29	377
1874-'75	894,262,000	2,341,000	41.91	40.52	6.78	3.63	7.16	382
1875-'76	1,026,374,000	2,553,000	46.38	35.88	4.27	6.50	6.97	402

The percentages in the previous tables represent not pounds but bales which vary in different supply-countries, and, consequently, the figures given are only approximations. For the season 1876-'77, now in progress, the following estimates of supply are given: United States, 2,950,000 bales, averaging 410 pounds each; East Indies, 1,350,000 bales, averaging 370 pounds; Egypt, 420,000 bales, averaging 600 pounds; Brazil, 500,000 bales, averaging 160 pounds; sundry Mediterranean, 90,000 bales, averaging 350 pounds; West Indies, Peru, &c., 110,000 bales, averaging 200 pounds; total, 5,420,000 bales, averaging 402.7 pounds, and amounting to 2,183,000,000 pounds. The probable consumption in Great Britain is given at 1,297,000,000 pounds, and on the continent at 1,009,000,000 pounds, making a total of 2,306,000,000 pounds, which is 123,000,000 pounds greater than the supply. Deducting 65,000,000 pounds, the estimated surplus held by continental spinners, and there remains a net deficit of 58,000,000 pounds. This estimate assigns a yield of 4,350,000 bales in the United States; if it should reach 4,500,000 bales the surplus will only raise the stocks in port to what they were at the beginning of the season 1875-'76, without leaving any surplus in the hands of spinners.

The drift of the circular, then, is that the demand would be in excess of the supply, provided the present indications of a revival of business throughout the civilized world do not prove deceptive. If trade continues dull, and if European politics continue to be disturbed by the agitations of the Eastern question, even a smaller crop than that estimated above will be sufficient to meet the prospective demand in Europe.

COTTON IMPORTS INTO THE BRITISH ISLES.—During the first nine months of 1876 the United Kingdom imported 6,551,066 hundred-weight of raw cotton from the United States, an increase of 870,095 hundred-weight, or 15.3 per cent. over the import of the same period in 1875. The receipts from Brazil were 359,658 hundred-weight, a decline of 35 per cent.; from Egypt, 1,029,142 hundred-weight, a gain of 163,219 hundred-weight, or 19.5 per cent.; from British India, 1,988,331 hundred-weight, a decline of 760,121 hundred-weight, or 27 $\frac{3}{8}$ per cent.; from other countries, 101,970 hundred-weight, a decline of 90,995 hundred-weight, or 47 per cent. The entire import was 10,038,167 hundred-weight, a decline of 7,598 hundred-weight. The total value of the import was £30,653,466, a decline of £4,323,895, or about one-eighth. The import of cotton-manufactures amounted to £1,441,519 against £945,385 during the first three quarters of 1875, an increase of 52 per cent.

MARKET-PRICES OF FARM-PRODUCTS.

NOVEMBER AND DECEMBER, 1876.

The following quotations represent, as nearly as practicable, the state of the market at the beginning of each month.

Articles.	November.	December.
NEW YORK.		
Flour, superfine State and western....per barrel..	\$4 60 to \$4 90	\$5 00 to \$5 30
extra State.....do.....	5 20 to 5 65	5 60 to 6 90
extra to choice western.....do.....	5 20 to 8 50	6 55 to 8 25
southern extra.....do.....	5 25 to 6 60	5 40 to 5 80
southern family.....do.....	6 65 to 8 75	6 65 to 8 75
Wheat, No. 1 spring.....per bushel..	1 25 to 1 30	1 33 to 1 35
No. 2 spring.....do.....	1 22 to 1 25	1 28 to 1 32
winter, red, western.....do.....	1 22 to —	1 30 to 1 35
winter, amber, western.....do.....	1 33 to —	1 34 to 1 45
winter, white, western.....do.....	1 33 to 1 35	1 34 to 1 45
Corn.....do.....	56 to 61½	53½ to 61
Oats.....do.....	31 to 49	37 to 49
Rye.....do.....	72 to 88	80 to 95
Barley.....do.....	1 08 to 1 18	80 to 85
Hay, baled, first quality for retail.....per ton..	14 00 to 18 00	14 00 to 18 00
baled, second quality for shipping..do.....	12 00 to —	12 00 to —
Beef, mess.....per barrel..	8 00 to 10 00	10 50 to 11 50
extra mess.....do.....	10 00 to 11 00	12 00 to 12 50
Pork, mess.....do.....	16 00 to 17 00	17 00 to —
extra mess.....do.....	13 50 to —	— to —
prime mess.....do.....	— to —	— to —
Lard.....per pound..	9½ to 10	9½ to 10½
Butter, western.....do.....	19 to 28	16 to 26
State dairy.....do.....	24 to 38	24 to 38
Cheese, State factory.....do.....	9½ to 14	11 to 14½
western factory.....do.....	11 to 13	10 to 13½
Sugar, fair to prime refining.....do.....	9½ to 9¾	9½ to 10½
Cotton, ordinary to good ordinary.....do.....	9½ to 10½	10½ to 11½
low middling to good middling..do.....	10½ to 11½	11½ to 12½
Tobacco, lugs.....do.....	5 to 8	5 to 8
leaf, common to medium.....do.....	8 to 11	8 to 11
Wool, American XXX and picklock.....do.....	48 to 50	48 to 50
American X and XXX.....do.....	36 to 46	36 to 48
American combing.....do.....	48 to 55	48 to 57
California spring clip.....do.....	16 to 28	16 to 28
California fall clip.....do.....	14 to 22	14 to 22
BOSTON.		
Flour, western superfine spring.....per barrel..	4 25 to 4 75	4 25 to 4 75
common spring extras.....do.....	5 00 to 5 75	5 00 to 5 75
good to fancy northwestern spring..do.....	5 75 to 9 50	5 75 to 9 25
good to fancy western winter.....do.....	6 00 to 8 50	6 00 to 8 00
southern family.....do.....	6 50 to 8 50	6 50 to 8 50
Wheat.....per bushel..	1 10 to 1 38	1 20 to 1 42
Corn.....do.....	58 to 65	58 to 66
Oats.....do.....	33 to 53	45 to 52
Rye.....do.....	75 to 80	85 to 90
Barley.....do.....	85 to 1 20	95 to 1 20
Hay, eastern and northern.....per ton..	12 00 to 20 00	12 00 to 19 00

Market-prices of farm-products—Continued.

Articles.	November.	December.
BOSTON—Continued.		
Hay, western choice.....per ton..	\$15 00 to \$18 00	\$15 00 to \$18 00
Beef, mess.....per barrel..	15 00 to ———	11 00 to ———
extra mess.....do.....	12 00 to ———	13 00 to ———
family.....do.....	12 50 to 13 50	14 00 to 15 00
Pork, prime.....do.....	16 00 to 16 50	14 00 to 14 50
mess.....do.....	18 00 to ———	17 00 to 17 50
Lard.....do.....	10 $\frac{3}{4}$ to 11 $\frac{1}{2}$	10 $\frac{1}{2}$ to 11 $\frac{1}{4}$
Butter, New York and Vermont.....per pound..	18 to 33	18 to 33
western.....do.....	16 to 33	15 to 33
Cheese, New York and Vermont factory.....do.....	10 $\frac{1}{2}$ to 13 $\frac{1}{2}$	12 to 14 $\frac{1}{2}$
western factory.....do.....	8 to 13	9 to 14
Sugar, fair to good refining.....do.....	9 $\frac{1}{4}$ to 9 $\frac{1}{2}$	9 $\frac{1}{2}$ to 10 $\frac{1}{8}$
Cotton, ordinary to good ordinary.....do.....	9 $\frac{1}{4}$ to 10 $\frac{3}{4}$	10 $\frac{1}{2}$ to 11 $\frac{3}{8}$
low middling to good middling.....do.....	10 $\frac{3}{8}$ to 12 $\frac{1}{8}$	11 $\frac{1}{2}$ to 13
Wool, Ohio and Pennsylvania.....do.....	37 to 52	40 to 52
Michigan.....do.....	34 to 40	36 to 42
other western.....do.....	33 to 40	36 to 42
pulled.....do.....	35 to 42 $\frac{1}{2}$	20 to 42 $\frac{1}{2}$
combing fleece.....do.....	50 to 55	50 to 57 $\frac{1}{2}$
California.....do.....	14 to 30	14 to 30
PHILADELPHIA.		
Flour, superfine.....per barrel..	3 50 to 4 00	3 50 to 4 00
Pennsylvania extra to choice.....do.....	4 12 $\frac{1}{2}$ to 6 50	4 12 $\frac{1}{2}$ to 6 25
western extra to choice.....do.....	4 12 $\frac{1}{2}$ to 0 00	6 00 to 6 75
Wheat, winter, white.....per bushel..	1 30 to 1 40	1 30 to 1 50
amber.....do.....	1 28 to 1 36	1 42 to 1 45
red.....do.....	1 20 to 1 29	1 20 to 1 37
Rye.....do.....	68 to 75	72 to 74
Barley.....do.....	75 to 85	60 to 95
Corn.....do.....	55 to 58	52 to 59
Oats.....do.....	28 to 41	28 to 41
Hay, baled, prime.....per ton..	——— to 17 00	16 00 to 17 00
common to fair shipping.....do.....	10 00 to 13 00	10 00 to 13 00
Beef, western mess.....per barrel..	6 00 to 8 00	6 00 to 8 00
extra mess.....do.....	10 00 to 11 00	10 00 to 11 00
Warthman's and Alburger's city family per barrel.....	14 00 to ———	14 00 to ———
Pork, mess.....per barrel..	16 50 to 17 00	17 25 to 17 50
prime mess.....do.....	15 50 to 16 00	15 50 to 16 00
extra prime.....do.....	16 50 to 17 00	16 50 to 17 00
Lard.....per pound..	10 $\frac{1}{2}$ to 15	10 to 15
Butter, choice Middle State.....do.....	30 to 38	26 to 35
choice western.....do.....	——— to ———	25 to 27
Cheese, New York factory.....do.....	——— to 14	8 $\frac{1}{2}$ to 14 $\frac{1}{2}$
Ohio factory.....do.....	——— to 13 $\frac{1}{2}$	7 to 13 $\frac{1}{2}$
Sugar, fair to good refining.....do.....	9 $\frac{3}{4}$ to 9 $\frac{5}{8}$	9 $\frac{1}{2}$ to 10 $\frac{1}{4}$
Cotton, ordinary to good ordinary.....do.....	9 $\frac{3}{4}$ to 10	10 $\frac{1}{2}$ to 10 $\frac{3}{4}$
low middling to good middling.....do.....	10 $\frac{1}{8}$ to 12 $\frac{1}{8}$	11 $\frac{1}{8}$ to 12 $\frac{3}{8}$
Wool, Ohio and Pennsylvania X to XXX.....do.....	41 to 45	41 to 45
other western.....do.....	31 to 38	31 to 38
pulled.....do.....	22 to 36	22 to 36
combing, washed and unwashed.....do.....	38 to 52	38 to 52
tub-washed.....do.....	30 to 46	30 to 46
BALTIMORE.		
Flour, superfine.....per barrel..	4 25 to 4 75	4 25 to 4 50
extra.....do.....	5 25 to 6 25	5 25 to 6 75
family.....do.....	5 75 to 8 50	6 00 to 8 50
Wheat, red.....per bushel..	1 10 to 1 35	1 25 to 1 43

Market prices of farm-products—Continued.

Articles.	November.		December.	
BALTIMORE—Continued.				
Wheat, amber	\$1 37	to \$1 40	\$1 45	to \$1 51
white	1 25	to 1 35	1 20	to 1 45
Rye	60	to 68	70	to 75
Oats	30	to 36	33	to 40
Corn	48	to 56½	48	to 57
Hay, Maryland and Pennsylvania	12 00	to 16 00	13 00	to 18 00
western	—	to —	—	to —
Pork mess	17 25	to 17 50	17 25	to —
prime mess	—	to —	—	to —
extra prime	17 00	to —	17 00	to —
Lard	10½	to 11½	11	to 11½
Butter, near-by receipts	26	to 28	22	to 27
western choice	25	to 26	22	to 28
Cheese, eastern factory	12½	to 14	13	to 15
western factory	7	to 13	9	to 14
Sugar, fair to good refining	9½	to 9½	9½	to 10
New Orleans grocery grades	—	to —	9½	to 10½
Tobacco, lugs	6½	to 9	6½	to 9
leaf, common to medium	9	to 11	9	to 11
Cotton, ordinary to good ordinary	9	to 10	9½	to 10½
low middling to good middling	10½	to 11½	11½	to 12½
CINCINNATI.				
Flour, superfine	4 25	to 4 75	4 25	to 4 60
extra	5 25	to 5 50	5 00	to 5 30
family and fancy	5 65	to 7 00	5 50	to 5 75
Wheat, winter, red	1 20	to 1 25	1 25	to 1 32
hill, (amber)	1 28	to 1 32	—	to 1 40
white	1 28	to 1 32	—	to 1 40
Corn	34	to 49	40	to 44
Oats	28	to 35	28	to 38
Rye	55	to 70	70	to 71
Barley	60	to 1 15	80	to 1 15
Hay, baled, No. 1	11 00	to 13 00	11 00	to 13 00
lower grades	9 00	to 10 00	8 00	to 10 00
Pork, mess	16 50	to 16 75	15 75	to 16 00
Lard	9½	to 10 00	9½	to 9¾
Butter, choice	20	to —	20	to 23
prime	17	to 18	1½	to 19
Cheese, prime to choice factory	12½	to 13	12½	to 13
Sugar, New Orleans, fair to good	—	to —	8½	to 9½
prime	—	to —	9½	to 10
Tobacco, lug	—	to —	—	to —
leaf	—	to —	—	to —
Cotton, ordinary to good ordinary	8¾	to 9¾	9½	to 10¾
low middling to good middling	10½	to 11	11½	to 12½
Wool, fleece-washed, common to fine	30	to 36	30	to 36
tub-washed	32	to 38	32	to 38
unwashed clothing	21	to 26	21	to 26
unwashed combing	27	to 32	27	to 32
pulled	30	to 31	27	to 31
CHICAGO.				
Flour, choice winter extras	6 25	to 7 25	6 25	to 7 25
common to good winter extras	5 00	to 6 00	5 00	to 6 00
spring extras, common to good	5 25	to 5 50	5 25	to 5 50
spring extras, choice	5 75	to 6 25	5 75	to 6 75
patent springs	6 00	to 7 50	6 00	to 7 50
spring superfine	2 50	to 40 00	3 60	to 4 00
Wheat, No. 1 spring	1 13	to 1 13½	1 15½	to 1 16

Market prices of farm-products—Continued.

Articles.	November.	December.
CHICAGO—Continued.		
Wheat, No. 2 spring per bushel..	\$1 11½ to \$1 12	\$1 13 to \$1 13½
No. 3 spring do.....	1 00 to 1 01	1 05½ to 1 05¾
Rye, No. 2 do.....	60 to 60½	66 to 66½
Barley, No. 2 do.....	79½ to 80	66 to 66½
Corn, No. 2 do.....	42½ to 42¾	43¾ to 44
Oats, No. 2 do.....	31½ to 32¾	32¾ to 32¾
Hay, timothy per ton..	8 50 to 11 50	9 50 to 11 50
prairie do.....	7 50 to 8 00	7 00 to 7 00
Beef, mess per barrel..	9 50 to 9 75	9 50 to 9 75
extra mess do.....	10 50 to 10 75	10 50 to 10 75
Pork, mess do.....	15 75 to 16 00	15 75 to 15 80
extra mess do.....	12 50 to 12 75	12 50 to 12 75
prime mess do.....	12 00 to 12 00	12 00 to 12 00
Lard per pound..	9½ to 9½	9¾ to 9¾
Butter, choice to fancy do.....	25 to 30	28 to 32
medium to good do.....	17 to 23	17 to 28
Cheese, good to choice factory do.....	11 to 12½	12 to 13
Sugar, New Orleans do.....	9½ to 9½	9½ to 10½
Wool, tub-washed do.....	36 to 45	35 to 45
fleece-washed do.....	33 to 39	33 to 37
unwashed do.....	21 to 26	20 to 27
pulled do.....	21 to 26	20 to 27
SAINT LOUIS.		
Flour, winter, common to choice per barrel..	3 50 to 7 00	3 50 to 7 00
Wheat per bushel..	95 to 1 13½	1 05 to 1 28
Corn do.....	39 to 45	43 to 45
Rye do.....	50 to 59	50 to 60
Barley do.....	45 to 1 15	30 to 1 15
Oats do.....	28½ to 35	25 to 32
Hay, timothy per ton..	11 00 to 13 00	11 00 to 13 00
prairie do.....	7 00 to 11 00	7 00 to 11 00
Beef, mess per barrel..	13 50 to 14 00	13 50 to 14 00
Pork, mess do.....	16 50 to 17 50	16 50 to 17 50
Lard per pound..	9 to 10	9½ to 10½
Butter, prime to choice dairy do.....	26 to 30	22 to 28
country-packed do.....	18 to 22	17 to 20
Cheese, Ohio factory do.....	12½ to 13½	12½ to 13½
New York factory do.....	13 to 14	13 to 14
Wool, tub-washed do.....	33 to 40	33 to 40
fleece-washed do.....	33 to 40	33 to 40
unwashed do.....	24 to 31	24 to 31
NEW ORLEANS.		
Flour, superfine per barrel..	5 00 to 6 00	4 75 to 5 00
extra do.....	6 00 to 6 75	5 00 to 6 00
choice to fancy do.....	7 00 to 7 50	6 25 to 7 37½
Corn per bushel..	56 to 65	54 to 65
Oats do.....	41 to 50	45 to 47
Hay, choice per ton..	19 00 to 18 00	18 00 to 18 00
prairie do.....	16 00 to 13 00	13 00 to 14 00
Beef, Texas per barrel..	10 00 to 12 00	12 00 to 15 00
western do.....	14 00 to 15 00	12 00 to 15 00
Fulton market per half barrel..	9 75 to 10 00	8 00 to 8 50
Pork per barrel..	17 50 to 18 25	18 37½ to 18 50
Lard per pound..	10½ to 11½	10½ to 11½
Butter, choice Goshen do.....	34 to 34	34 to 35
choice western do.....	24 to 25	22 to 23
Cheese, choice western factory do.....	12½ to 13	12 to 12½
New York cream do.....	15 to 15½	15 to 16

Market-prices of farm-products—Continued.

Articles.	November.		December.	
NEW ORLEANS—Continued.				
Sugar, fair to fully fair.....per pound..	\$0 7½ to	\$0 7¾	\$0 7½ to	\$0 8½
prime to strictly prime.....do.....	8 to	8½	8½ to	8¾
clarified, white and yellow.....do.....	9 to	10	9½ to	10½
Cotton, ordinary to good ordinary.....do.....	8¾ to	9½	to	10¾
low middling to good middling.....do.....	10¾ to	11¼	11½ to	12½
Tobacco, lugs.....do.....	5½ to	8	5½ to	7½
leaf, low to medium.....do.....	8½ to	12	8 to	11
SAN FRANCISCO.				
Flour, superfine.....per barrel..	4 00 to	4 25	4 25 to	4 50
extra.....do.....	4 50 to	4 75	4 75 to	5 00
family and fancy.....do.....	5 00 to	5 50	5 00 to	5 50
Wheat, California.....per cental..	1 50 to	1 75	1 60 to	2 00
Oregon.....do.....	1 50 to	1 75	1 60 to	1 95
Barley.....do.....	90 to	1 15	90 to	1 17½
Oats.....do.....	1 40 to	1 75	1 50 to	1 95
Corn.....do.....	1 10 to	1 15	1 05 to	1 10
Hay, State.....per ton..	7 50 to	13 50	10 00 to	16 00
Pork, mess.....per barrel..	23 60 to	24 00	23 00 to	24 00
prime mess.....do.....	17 50 to	18 50	18 00 to	20 00
Beef, mess.....do.....	9 00 to	10 00	9 00 to	10 00
family mess.....per half barrel..	8 50 to	10 00	8 50 to	10 00
Lard.....per pound..	13½ to	15	13 to	14
Butter, overland.....do.....	20 to	22	16 to	18
California.....do.....	25 to	45	25 to	45
Oregon.....do.....	20 to	25	20 to	25
Cheese.....do.....	12½ to	15	12½ to	15
Wool, native.....do.....	10 to	12	10 to	12
California.....do.....	15 to	22	15 to	22
Oregon.....do.....	25 to	25	20 to	25

LIVE-STOCK MARKETS.

NEW YORK.				
Cattle, extra beeves.....per cental..	10 00 to	10 25	to	10 75
good to prime.....do.....	9 25 to	9 59	10 00 to	10 25
common to fair.....do.....	to		7 75 to	9 00
Texans.....do.....	6 00 to	7 50	to	
milk-cows.....per head..	45 00 to	75 00	40 00 to	70 00
veal-calves.....per cental..	5 00 to	10 00	6 50 to	9 50
Sheep.....do.....	4 00 to	6 00	4 25 to	6 25
Swine.....do.....	5 60 to	6 12 $\frac{1}{2}$	5 90 to	6 06 $\frac{1}{2}$
PHILADELPHIA.				
Cattle, prime beeves.....per cental..	6 12 $\frac{1}{2}$ to	6 25	6 12 $\frac{1}{2}$ to	6 50
fair to good.....do.....	5 00 to	6 00	5 12 $\frac{1}{2}$ to	6 00
common.....do.....	3 00 to	4 75	3 50 to	5 00
Sheep.....do.....	1 00 to	5 75	1 00 to	6 12 $\frac{1}{2}$
Swine, corn-fed.....do.....	8 25 to	8 75	7 00 to	8 00
BALTIMORE.				
Cattle, best beeves.....per cental..	4 87 to	5 25	to	
first quality.....do.....	4 00 to	4 75	to	
medium or good quality.....do.....	3 12 to	3 75	to	
ordinary.....do.....	2 25 to	3 00	to	

Live-stock markets—Continued.

Articles.	November.		December.	
BALTIMORE—Continued.				
Cattle, general average of the market..per cental..	\$3 62	to	_____	_____ to _____
most of the sales.....do.....	3 12	to	\$4 25	_____ to _____
milch-cows.....per head.....	_____	to	_____	_____ to _____
Sheep.....per cental.....	2 00	to	4 75	_____ to _____
Swine.....do.....	7 00	to	7 87½	_____ to _____
CINCINNATI.				
Cattle, good to prime butchers' steers..per cental..	3 75	to	4 25	\$4 25 to \$4 40
fair to medium.....do.....	2 50	to	3 50	2 60 to 3 50
common.....do.....	2 00	to	2 40	2 00 to 2 50
milch-cows.....per head.....	_____	to	_____	_____ to _____
veal-calves.....per cental.....	_____	to	_____	_____ to _____
Sheep.....do.....	2 25	to	4 50	2 25 to 4 50
Swine.....do.....	4 90	to	5 60	5 00 to 5 85
CHICAGO.				
Cattle, extra graded steers.....per cental..	_____	to	_____	_____ to _____
choice beeves.....do.....	4 60	to	4 75	_____ to 5 00
good beeves.....do.....	4 10	to	4 40	_____ to _____
medium.....do.....	3 30	to	4 00	2 80 to 3 50
inferior natives.....do.....	1 75	to	2 90	2 25 to 2 50
Texans, through droves.....do.....	2 25	to	3 25	_____ to _____
Sheep.....do.....	3 00	to	4 25	3 25 to 4 12½
Swine.....do.....	4 25	to	6 00	5 50 to 6 00
SAINT LOUIS.				
Cattle, good to choice native steers....per cental..	4 50	to	4 90	4 50 to 4 90
common to fair natives.....do.....	3 25	to	4 25	3 25 to 4 25
inferior to common.....do.....	2 00	to	3 25	2 00 to 3 25
Texans, fair to choice.....do.....	3 00	to	4 00	3 00 to 4 00
Sheep.....do.....	2 50	to	4 50	2 50 to 4 50
Swine.....do.....	5 50	to	6 25	5 50 to 6 25
Horses, plug.....per head.....	30 00	to	65 00	30 00 to 65 00
plain to choice southern.....do.....	50 00	to	90 00	50 00 to 90 00
street-car.....do.....	75 00	to	125 00	75 00 to 125 00
heavy draught.....do.....	100 00	to	130 00	100 00 to 130 00
good drivers.....do.....	175 00	to	225 00	175 00 to 225 00
extra.....do.....	225 00	to	250 00	225 00 to 250 00
auction horses and ponies.....do.....	25 00	to	45 00	25 00 to 45 00
Mules, 14 to 15 hands high.....do.....	85 00	to	120 00	85 00 to 120 00
15 to 16 hands high.....do.....	115 00	to	150 00	115 00 to 150 00
extra.....do.....	175 00	to	185 00	175 00 to 185 00
NEW ORLEANS.				
Cattle, Texas beeves, choice.....per head.....	35 00	to	45 00	35 00 to 45 00
first quality.....do.....	_____	to	35 00	_____ to 35 00
second quality.....do.....	25 00	to	30 00	25 00 to 35 00
western beeves.....per cental.....	_____	to	_____	_____ to _____
milch-cows.....per head.....	40 00	to	90 00	50 00 to 100 00
veal-calves.....do.....	7 00	to	9 00	7 00 to 9 00
Sheep.....do.....	2 00	to	6 00	2 00 to 6 00
Swine.....per cental.....	5 00	to	7 00	5 50 to 7 00
Horses, good combined.....per head.....	150 00	to	200 00	_____ to _____
plug.....do.....	100 00	to	150 00	_____ to _____
common.....do.....	40 00	to	80 00	_____ to _____
Mules, well broken, first class.....do.....	175 00	to	200 00	_____ to _____
second-class.....do.....	100 00	to	150 00	_____ to _____

FOREIGN MARKETS.

WHEAT.—In the United Kingdom the month of November was favorable to farm-operations till about the close of the third week, when a sharp spell of frost set in, but it was again succeeded by a mild temperature with genial rain. The conditions of growth for fall-wheat have on the whole been quite favorable, and are in striking contrast to the disastrous seed-time of 1875. The fall-sowing was completed in good order. Supplies of British wheat at the country markets were small, and dullness the prevailing feature of the home trade, causing a decline at several points of 1s. per quarter for English wheat. In the absence of authorized inquiries by government into the yield of the crops, several leading statisticians have been estimating the wheat yield. The *Agricultural Gazette* sets down the aggregate product at between 95,070,000 and 102,179,600 bushels; the *Yorkshire Post*, from 96,771,000 to 103,365,000; Mr. Kains-Jackson, 98,756,000; the *Farmer*, 90,526,000; the *Magnet*, 98,756,000; the *Mark Lane Express*, 92,584,000; Mr. Scott, 88,960,000. The average of these estimates is about 96,600,000. The population of the United Kingdom is estimated at 33,000,000, consuming in the aggregate about 180,000,000 bushels of wheat. This will require a foreign import of nearly 90,000,000 bushels. Other estimates raise the necessary import to at least 100,000,000 bushels. Changes in the British land system and in the conditions of cereal production are foreshadowed by movements already inaugurated, which will in a marked degree affect the future demand for foreign grain.

Considerable anxiety has been felt in regard to the supply of present demands, especially in view of the falling off in the American import. Supplies from Russia and India were unusually large, while American receipts had largely fallen off, especially from Atlantic ports. But as the Black Sea ports will soon be closed for the winter, America is looked to as the main source of supply. The movement of American crops to the seaboard has been very slow on account of the unwillingness of the great railway-lines to furnish transportation at existing rates of tariff. This slowness of transatlantic grain movements, together with the chronic uneasiness growing out of the unsettled state of the eastern question and the liability of a general war, had kept the local grain-trade quite firm and had made holders very unwilling to part with their stocks.

The French crop of wheat was also short, being estimated by the *Bulletin des Halles*, of Paris, at between 85,000,000 and 90,000,000 hectoliters, (241,214,700 and 255,403,800 bushels.) Its value was supposed to be enhanced 4 or 5 per cent. by the superior quality of the grain. Subsequently the *Echo Agricole*, from returns by 3,500 correspondents in all parts of the wheat-growing region, estimated the wheat-area of 1876 at 16,383,540 acres, yielding 256,726,250, an average of 12.6 bushels per acre. This crop is somewhat larger than that of 1875, as estimated by M. Banal, and about two-thirds of the large crop of 1874. The domestic consumption is estimated by the last-named statistician at 204,322,040 bushels, besides 39,729,480 bushels required for seed, making a total consumption of 243,051,000 bushels, which leaves but a small margin for export.

The sales of English wheat during the week ending November 18 were 48,063 quarters, at 48s. 3d. per quarter, against 48,012 quarters, at 47s. 8d., during the corresponding week of 1875. The London averages

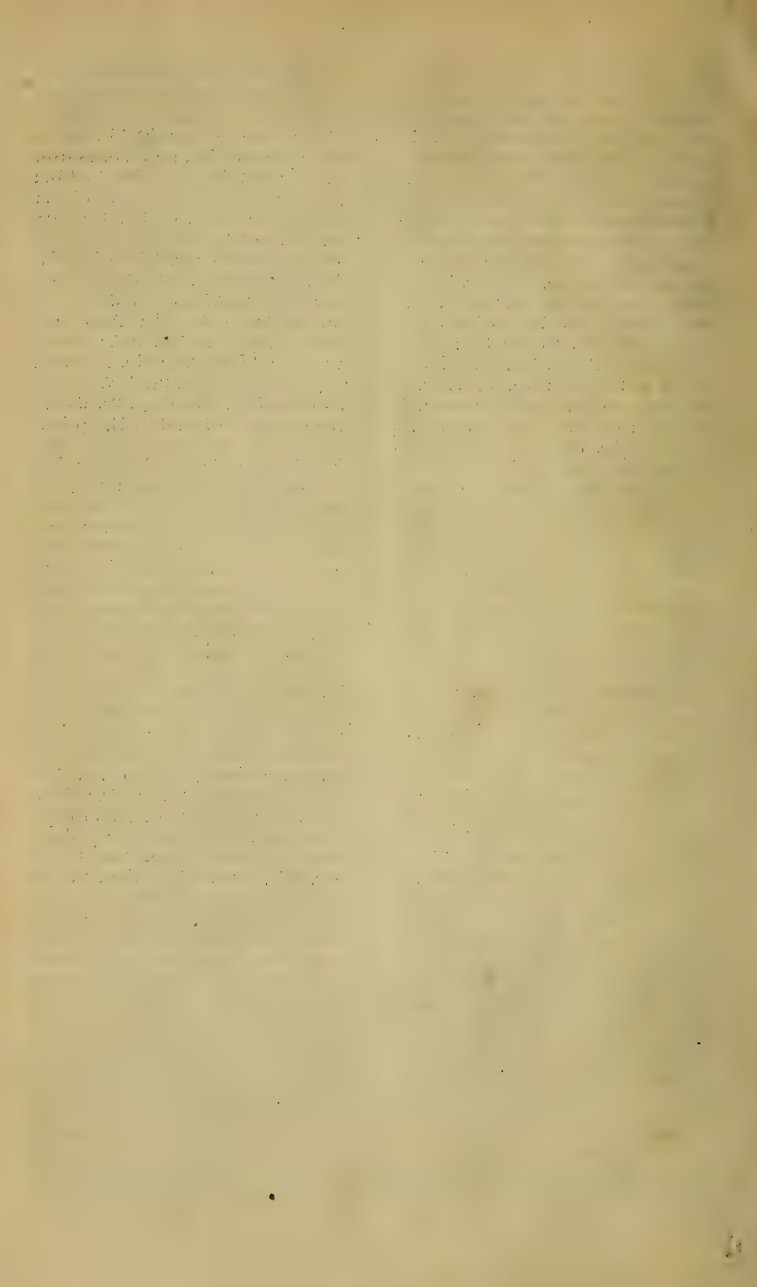
were 49s. 4d. on 1639 quarters. The imports into the United Kingdom for the week closing November 11, were 744,753 cwt. The tendency of the market was to close dealing, buyers not readily yielding to the demands of the sellers. In Mark Lane, Essex and Kent white brought 45s. to 52s. per quarter; ditto, red, 43s. to 49s.; Norfolk, Lincolnshire, and Yorkshire, red, 44s. to 46s.; Dantzic, mixed, 52s. to 55s.; Königsberg, 50s. to 45s.; Ghirka, 45s. to 47s.; Russian, hard, 44s. to 46s.; Saxonska, 47s. to 50s.; Danish and Holstein, red, 46s. to 49s.; American, 48s. to 53s.; Chilian, white, 48s.; Californian, 50s.; Australian, 51s. to 53s.

At Liverpool, British white wheat was quoted at 10s. 1d. to 10s. 7d. per cental; ditto, red, 9s. 7d. to 10s. 1d.; Australian, 10s. 8d. to 10s. 10d.; Oregon, 10s. 6d. to 10s. 8d.; Californian, 10s. 4d. to 10s. 6d.; club and choice, 10s. 7d. to 10s. 8d.; Chilian, 9s. 8d. to 10s. 1d.; American white, 9s. 11d. to 10s. 3d.; ditto, red winter, 9s. 7d. to 10s. 10d.; choice spring, 10s. 3d. to 10s. 5d.; No. 1 spring, 9s. 11d. to 10s. 2d.; No. 2 spring, 9s. 7d. to 9s. 10d.; No. 3 spring, 9s. 1d.; Canadian white, 9s. 11d. to 10s. 3d.; red club and golden drop, 10s. 1d. to 10s. 5d.; Bombay, 9s. 6d. to 9s. 10d.; Calcutta, 8s. 8d. to 9s. 4d.; French, 10s. to 10s. 6d.; Egyptian, 7s. 3d. to 9s. 3d.

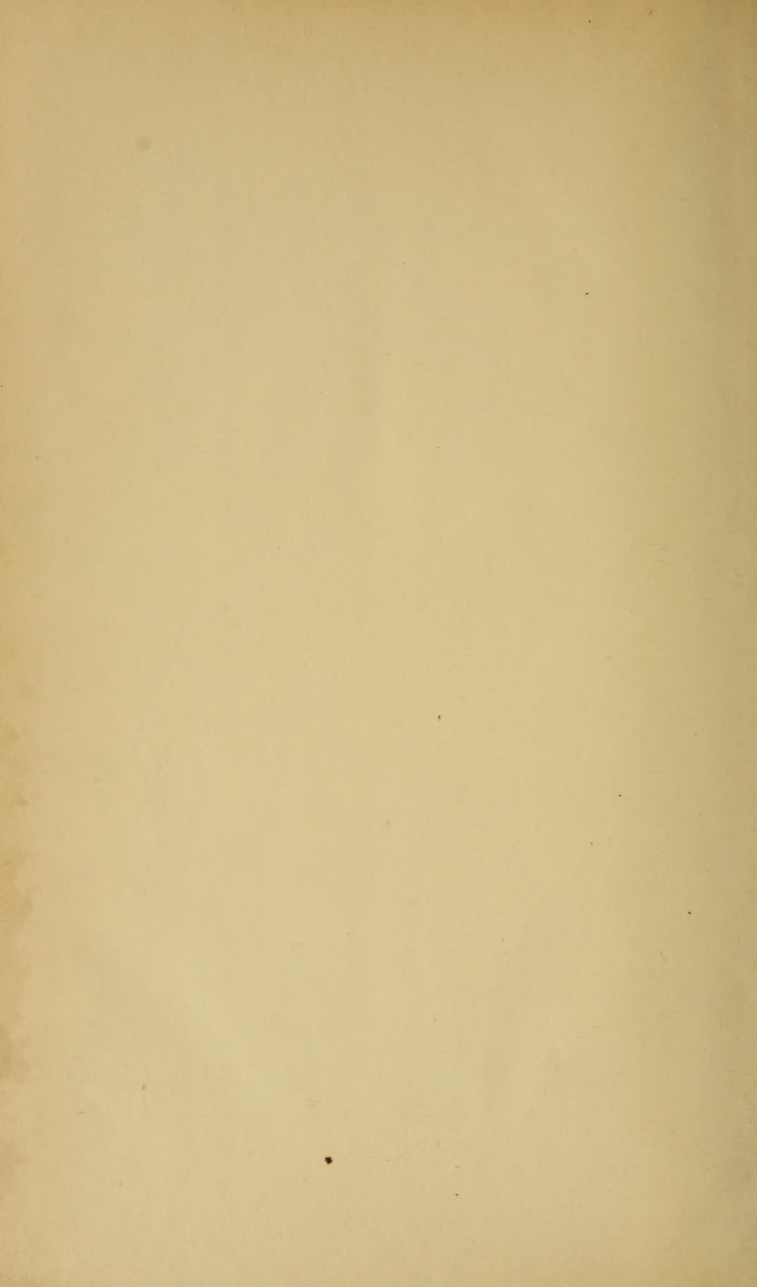
In Paris the prevailing character of the wheat-trade was firmness, but purchases for consumption were made sparingly, while holders were not anxious to sell. The average price of wheat was 47s. 7d. per quarter. During the week ending November 18, 28 French provincial markets had advanced or had shown an advancing tendency, against 12 the previous week; 58 stood calm to firm against 61, and 14 showed a declining tendency against 24, the previous week. At Bordeaux, the millers, finding but slim profits in existing rates, preferred to stop their machinery. A declining tendency is noted at Berlin, Hamburg, and Dantzic. At Alexandria, Egypt, a demand in excess of supplies had somewhat raised prices.

FLOUR.—Imports into the United Kingdom for the week ending November 11, 105,190 cwt. against 146,538 the previous week. In Mark Lane, the best town households brought 38s. to 43s. per 280 pounds; best country household, 36s. to 38s.; Norfolk and Suffolk, old, 32s. to 33s.; French, 30s. to 35s.; American and extra, per barrel, 23s. to 26s. At Liverpool, English and Irish superfines were quoted at 35s. to 38s.; ditto, extras, 42s. to 47s.; French, 38s. 6d. to 46s. 6d.; Trieste, 47s. 6d. to 54s. 6d.; California and Oregon, 37s. to 42s. 6d. American, western and extra State, 25s. 6d. to 28s. 6d.; Batimore and Philadelphia, 25s. 6d. to 29s. 6d.; Ohio and extra, 27s. 6d. to 30s. 6d.; extra Canadian, 27s. to 29s.; patent barrel, 32s. to 37s. In Paris superior flour averaged about 37s. per 280 pounds.

MAIZE.—In Mark Lane, white maize brought 28s. to 29s. per quarter; ditto, yellow, 26s. to 27s. At Liverpool, American new white was quoted at 29s. to 29s. 6d. per 480 pounds; mixed, 26s. to 26s. 3d.; Galatz, 27s. 9d. to 28s.; Don, 27s. 6d. to 28s.







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